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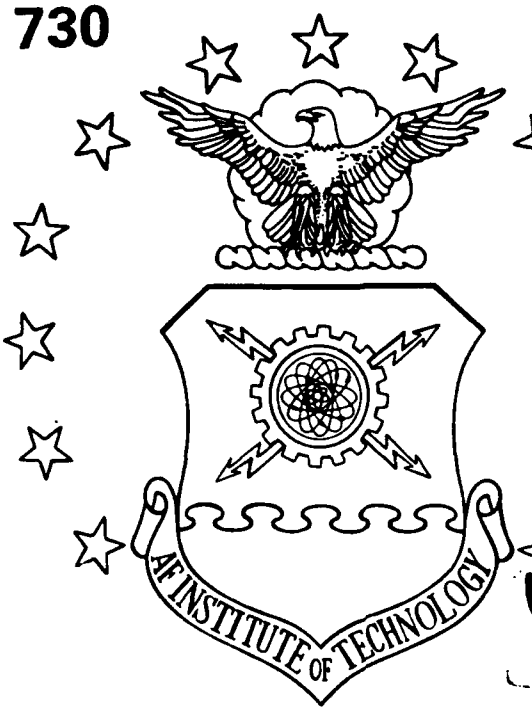

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INTEGRATING EXPERT, DECISION SUPPORT, AND DATABASE SYSTEMS FOR DECISION-MAKING: A KC-10 SERVICE ACTION APPLICATION

THESIS

Josephine L. Scarlett, B.S.
Captain, USAF

AFIT/GLM/LSC/90S-48

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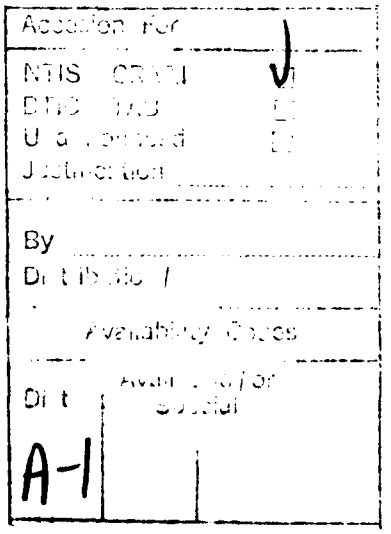

AFIT/GLM/LSC/90S-48

INTEGRATING EXPERT, DECISION SUPPORT, AND DATABASE SYSTEMS FOR DECISION-MAKING: A KC-10 SERVICE ACTION APPLICATION

THESIS

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Logistics Management

Josephine L. Scarlett, B.S.
Captain, USAF

September 1990

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Acknowledgments

My main goal of this research effort was to develop a computerized tool to help my past coworkers and friends at the KC-10 System Program Management Office better manage KC-10 service actions (SAs). Having had the experience trying to learn and track SAs through the complicated SA process made me want to develop a computer system to simplify SA management for both the new and the experienced Program Manager. I want to thank the entire KC-10 Office for their time during the testing of the developed system and to Mr. Gary Davis for always believing in my ability to develop the system. I also want to express a special thanks to my good friend Ms. Pam Russell. Her time and patience in giving me information I needed to accomplish the system was invaluable to my research.

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Captain Josephine L. Scarlett

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Abstract

The primary objective of this research was to develop an integrated computer system and determine whether or not the system could help KC-10 logisticians better manage contractor recommended modifications to the KC-10 aircraft. An integrated prototype evolved from the development of different parts of the system and the integration of those parts into one system. Testing of the system involved having twelve KC-10 Program Managers solve six scenarios. Six people used the system to answer scenario questions and six people answered scenario questions without the system. Comparisons of the results of the scenario tests confirmed that using the prototype significantly improved the test performance of the Program Manager. The conclusions of this research include recommendations to implement this prototype in the KC-10 System Program Management Office and to adapt the prototype to other contractor logistics supported weapon systems to help other logisticians raise their management performance levels.

INTEGRATING EXPERT, DECISION SUPPORT, AND DATABASE SYSTEMS FOR DECISION-MAKING: A KC-10 SERVICE ACTION APPLICATION

I. Introduction

Overview

The KC-10A is a derivative of the DC-10-30CF convertible freighter aircraft modified only as necessary to meet Advance Tanker Cargo Aircraft (ATCA) mission requirements. The KC-10 Tanker/Cargo is a contractor logistics supported (CLS) weapon system managed by the KC-10/C-9 System Program Management Office (MMAK) at Oklahoma City-Air Logistics Center (OC-ALC). There are differences in managing the KC-10 CLS program compared to Air Force organically supported weapon systems because the logistics concept is tied directly to a material support and maintenance concept primarily consisting of contractor support. CLS is designed to take maximum advantage of existing maintenance practices and inventories of spare parts and materials which are owned by domestic and overseas air carriers as well as inventories owned or controlled by aircraft or component manufacturers. The KC-10 has its own supply system, depot maintenance practices and facilities, technical order procedures, inventory management, and distribution system separate from Air Force systems. The procedures and processes used to manage these differences have been developed from "scratch" because specific regulations for their development were non-existent. Since

management of the KC-10 has evolved from "scratch", there are few people who have expert knowledge of the management processes. The Service Action (SA) process is an example of a KC-10 management process which has evolved in this manner and in which only a few people from the KC-10 System Program Management Office know the processing details.

Service Action (SA) Management

Contractor recommended inspections, maintenance and modifications are submitted to OC-ALC/MMAK through KC-10 Service Bulletins, Engineering Change Proposals, Service Letters, Technical Change Proposals, Airworthiness Directives, and All Operators Letters; and are collectively known as service actions (for definitions, see Appendix A). Recommendations are offered to the KC-10 System Program Management Office to improve safety, reliability, longevity, and capability of the aircraft. The SA process is the method used to manage KC-10 configuration control of these contractor recommended changes.

The KC-10 SA process requires logisticians to make multi-variable decisions and to track SAs through a complex intertwining process. To complicate things further, the process varies depending on different variables of the SA. Neither the variables causing differentiation from the "normal" process flow nor the flow itself are documented. The estimated time for a SA to be processed, from its arrival to OC-ALC to where time

compliance technical orders (TCTOs) are performed on aircraft, is a year to a year-and-a-half.

KC-10 logisticians are responsible for several SA's in different steps of the SA process. And, since the process varies and repeats so infrequently, knowing what step is next for each SA is not always obvious, even to the experienced logistician. Besides tracking the physical location of SAs, logisticians must also monitor the necessary funding processes associated with SAs. It is the logistician's responsibility to make sure the required funding has been obligated by the principle contracting officer (PCO) and paid to the contractor by the PCO or the administrative contracting officer (ACO). The complexity of the SA process and the shortage of expertise suggest that a system containing SA processing knowledge in a form that makes it easily accessible to all KC-10 logisticians could be beneficial.

Computer Potential in Logistics Management

Today's complex working environment requires logisticians to make more multi-variable decisions than ever before. Logisticians must compare various interacting alternatives and select the combined mix of alternatives that best meets their needs. Often the number of possible combinations make it humanly impossible to evaluate all possibilities and arrive at timely decisions without computer help (3:128).

There is increasing interest for employing computer technology in the field of logistics management (2;13;18;23).

Emmelhainz discusses the merits of decision support systems (DSSs) in logistics management applications:

> Decision support concepts lead to effective solutions which take advantage of state-of-the-art computer technology, data manipulation and modeling capability to attack logistics problems. (13:293)

The complexities of managing KC-10 SAs make it difficult for logisticians to make effective management decisions. Logisticians need help and a computer system which aids in tracking SA location, and determining when SA compliance will occur could possibly benefit the KC-10 Program. This system might be a decision-support system (DSS), an expert system (ES), a database management system (DBMS), or perhaps a combination of these systems.

Decision-Support Systems. Decision support systems are "interactive computer based systems that help decision makers use data and models to solve unstructured problems" (6:1). A slightly different definition provided by Allen and Emmelhainz states:

> A decision support system is a computer system aimed at quickly assisting managers in making effective decisions in those areas where both management judgment and computer analysis are required. (3:129)

DSSs focus on improving individual effectiveness with decision-making by expediting problem solving. DSSs provide a means for decision-makers to improve the consistency and accuracy of their decisions which increases the quality of their decisions. Consistent and accurate decisions also promote

learning or training and increases the quality of interpersonal communication within the organization. DSSs increase organizational control by providing the organization with a standardized mechanism and common conceptual base (4:95-96).

The complex decision-making environment of KC-10 SA management is an area where a DSS could make significant contributions in helping logisticians. A DSS might bring structure and consistency to an area which previously relied solely on the intuitive abilities of individuals to manage SAs.

Expert Systems.

> An expert system is a problem-solving program that achieves good performance in a specialized problem domain that generally requires specialized knowledge and skill. The system processes the knowledge of experts and attempts to mimic their thinking, skill, and intuition. (15:23)

The objective of an ES is to provide to the user a conclusion or decision that is equal to or better than a human expert (31:121). Helferich et al state:

> The ES tries to duplicate the knowledge base of the recognized expert or experts so that system users can utilize the software to make decisions based on vast experience and knowledge of the field. (17:46)

ESs improve organizational effectiveness by providing a documentable, consistent, permanent record. The ES duplicates the decision-making of experts and once developed is less expensive than people power (17:58).

An ES could capture the knowledge of the few individuals who are familiar with the intricacies of the KC-10 SA process

flow and present it in a manner understandable by individuals who are not as familiar with the flow.

Database Management Systems. Database management systems (DBMSs), commonly used in business applications are:

> ...computer programs designed to create, maintain, and use databases (an organized collection of data). The program is designed to collect, store, retrieve, and report information in an organized manner. (34:8)

A system which automates portions of KC-10 SA management requires a database which contains information on each KC-10 SA. Having a system which effectively maintains and updates this database increases the potential effectiveness of the whole system.

Potential for Integrating DSS and ES.

> There is growing recognition that the ability to provide automated support for unstructured decision-making within organizations will require the integration of knowledge-based expert system techniques and traditional decision support system architecture. (5:21)

In discussing ES as a component of a DSS, Turban and Watkins report:

> The basic idea of this approach is that ES can be added onto a DSS to extend its capabilities for performing functions that the regular DSS cannot perform. (30:141)

> The objective of such integration is to take advantage of the strong points of both DSS and ES in order to create even more powerful and useful synergetic computer based systems. (30:139)

Specific Problem

According to Mr. Gary R. Davis, deputy chief of the KC-10/C-9 System Program Management Office, the current methods KC-10 logisticians use to manage SAs are labor intensive, time-consuming, poorly understood, and inaccurate. Although efficient SA management is vital to the KC-10 Program, logisticians are not aware of or able to report accurate status of KC-10 SAs (7).

Research Objective

The objective of this research is to determine whether it is possible to automate the complex decision-making processes of the KC-10 SA process and develop a tool to help KC-10 logisticians manage SAs. To achieve this objective this research will develop a computer system which determines the processing flow and the milestone date chart for individual KC-10 SAs.

Research Questions

Questions which will have to be answered in this research project include:

1. To what extent can the KC-10 SA process flow be determined?
2. What variables alter the "normal" flow?
3. To what extent can the current status of each KC-10 SA be determined by the computerized system?
4. To what extent can management of KC-10 SAs be computerized using expert system, decision support system, and database system technology?
5. Once the computer system requirements are developed, can the integrated computer system determine the next step in the SA process and provide SA completion dates of SA steps as well or better than KC-10 logisticians?

Justifications

Several reasons warrant research in the KC-10 SA area:

1. Effective and efficient management of the KC-10 is strongly desired.

> Greater consistency can be achieved when employees performing similar tasks receive complete instructions from a central source (i.e. the ES) as opposed to piecemeal instructions from a variety of different individuals within the company who may not be currently familiar with the particular task at hand. (18:68)

2. The complexity of the SA process is considered substantial.

> Many decisions in logistics function areas are made under extremely complex circumstances by acquiring information about particular problems and then applying "rules of thumb" obtained through experience. Expert systems capture these "rules of thumb" in a form of a knowledge base and use the acquired knowledge about a problem to suggest short-cut solutions. (18:35)

3. The SA process is ill-structured and weakly-understood by the KC-10 logisticians. Computer systems can provide logisticians with new managerial tools which can extend their capability to explore alternatives and add structure to their decision-making process (13:289 and 3:129). Emmelhainz elaborates further:

> Notice that once our efforts bring structure and understanding to the problem area, we might no longer categorize it as unstructured. We might also see that, through computerization, we have brought significant efficiency to the process. (13:290)

4. Retaining expertise is a challenge in the KC-10 Program Office environment.

> The ability to have the knowledge of a human expert captured on disk alleviates panic when this individual

is out ill, away on business or vacation, moves or retires. (18:68)

5. New employees are common in the KC-10 Program Office and learning how to manage SAs properly, takes time.

> The inexperienced person will then be able to operate as a much more experienced and knowledgeable worker. (17:46)

Scope of Study

This research study considers only the KC-10 CLS program. Although there are other CLS programs managed by OC-ALC, their process for managing contractor suggested modifications and configuration control might differ from the KC-10's SA process. The magnitude and time constraints of this study prevent research in any other CLS program. The process and conclusions of this research might be useful, however, in studying and improving these other CLS programs processes.

Method of Organization

Chapter I presents the basis of the research. The general and specific problem sections establish the topic under consideration. Background material on computer systems, the potential of their application to logistics management, and the potential of integrating computer systems are provided to rationalize the research objective. The research questions and the scope of the research present the focus of the research. Chapter II contains background information on the characteristics of DSSs and ESs, and relevant literature pertaining to the

development and structure of the systems. Chapter III presents the specific methodology to develop a prototype expert-decision support-database computer system for KC-10 SAs and to validate the resulting system. Chapter IV details the process involved in verifying the developed computer system. Chapter V presents the analysis of the validation process. Chapter VI offers conclusions of the research and recommendations for future improvements and for additional research.

II. Literature Review

Literature Overview

The purpose of this chapter is to examine literature related to the characteristics, structure, and development of decision support systems (DSS) and expert systems (ES). In order to determine whether the research problem is a suitable domain for an integrated expert-decision support-database system, a thorough understanding and a comparison of each separate system is warranted.

Database Management Systems (DBMSs)

DBMSs manage stored information. They are computer programs that collect, store, retrieve and report information in an organized way. The advantages of a DBMS include the following:

1. It offers rapid access to and flexible use of information. A DBMS uses sophisticated methods of organization and retrieval.
2. The incidence of redundancy (repetition) is limited and information is kept current. This is critical, because there is a direct relationship between the efficiency of a computer program and its ability to avoid storing unnecessary information and to keep the information it does store up-to-date.
3. The cost/benefit ratio is good. The cost of setting up and operating a DBMS is low compared to the value of the benefits it affords.
4. Storage of information is compact, compared to paper storage.
5. Mundane, repetitive tasks such as searching for information and preparing reports can be automated.
6. A DBMS imposes an organized structure that would be difficult to attain manually. Once a DBMS has been established, its maintenance encourages efficiency in office procedures. (34:8)

The disadvantages of a DBMS include:

1. Operations and programming require skill in the use of the system as well as a knowledge of DBMS concepts.
2. Because information is stored in a complex way, it can be difficult to back up or reconstruct.
3. Information is centralized, and it requires maintenance. Someone must assume responsibility for administering the DBMS.
4. As the power and features of the DBMS are utilized, more complex information management is required, and this generates new administrative problems. (34:8)

DBMSs are often categorized according to the way they organize and access data. The most common categories are the record model, the relational model, the hierarchic (tree) model, the network (graph) model, and the rule model.

The Record Model. The data structure for the record model is a set of records. A record consists of a set of fields. The record model usually includes at least three integrity constraints. "First, each record must contain a field whose value is unique among all records (of that type). This field is called the key field" (28:227). Second, new record types cannot be added. And, third, every field must contain a value (28:228).

The Relational Model. In the relational model, information is stored in related data tables in separate files. A table organizes data into rows (records) and columns (fields) (34:15). Each column (field) has a "domain that defines the set of allowed values for that field" (28:228). Operations do not depend on the order of the fields or records in the tables, and operate on entire relations rather than on individual records. Integrity

constraints of the relation model specify that each row in a relation must contain a unique set of values. "However, no single file need contain a unique (key) value for a relation" (28:230).

The Hierarchic Model. The structures in the hierarchic model represent information that is captured in fields in the relational model. Every data structure must have a root record and no instance of a descendent record can exist without an instance of its parent record (28:230).

The Network Model. In a network structure any data element can be related to any other data element. It has more flexibility than a hierarchical structure, but control of relationships among elements within the structure is less (32:166).

The Rule Model. The rule model describes data using a set of rules. "These rules may be considered as a set of data definitions, some of which may be conditional" (28:233). This model is most commonly used where part of decision making involves making inferences based on the data.

Decision Support Systems (DSSs)

DSS Characteristics. DSSs tend to be directed at unstructured or semi-structured, under-specified problems. DSSs attempt to combine the use of models with traditional data access and retrieval functions. They specifically focus on features which make them easy to use by noncomputer people and they

emphasize flexibility and adaptability to accommodate changes in the environment and the decision making approach of the user (27:8).

DSS Structure. Three main subsystems constitute the structure of a DSS. These are the dialogue, database, and model subsystems (see Figure 1).

The dialogue subsystem is the interface between the user and the DSS. A partial set of desirable characteristics for a DSS dialogue subsystem includes:

1. The ability to handle a variety of dialogue styles, perhaps with the ability to shift among them at the user's choice.
2. The ability to accommodate user actions in a variety of media.
3. The ability to present data in a variety of formats and media.
4. The ability to provide flexible support for the user's knowledge base. (27:25)

The database subsystem maintains, stores and retrieves data. A partial set of capabilities required in the database subsystem includes:

1. The ability to combine a variety of data sources through a data capture and extraction process.
2. The ability to add and delete data sources quickly and easily.
3. The ability to portray logical data structures in user terms so the user understands what is available and can specify needed additions and deletions.
4. The ability to handle personal and unofficial data so the user can experiment with alternatives based on personal judgement.
5. The ability to manage this wide variety of data with a full range of data management functions. (27:22)

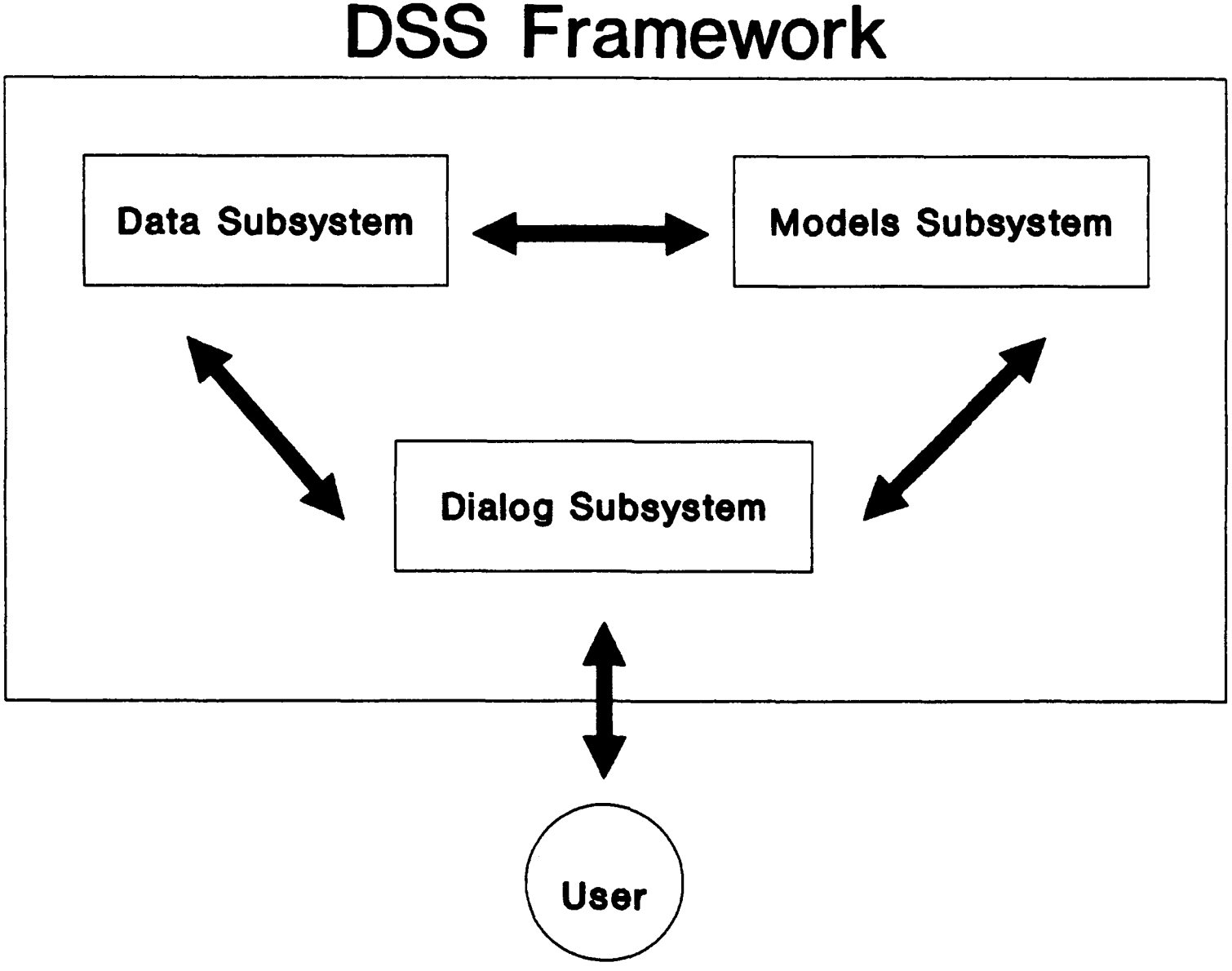

Figure 1. DSS Framework (15:22)

The model subsystem provides the means for the user to explore alternative decision-making processes. The key capabilities in the model subsystem include:

1. The ability to create new models quickly and easily.
2. The ability to catalog and maintain a wide range of models, supporting all levels of management.
3. The ability to interrelate these models with appropriate linkages through the database.
4. The ability to access and integrate model "building blocks".
5. The ability to manage the model base with management functions analogous to database management (e.g. mechanisms for storing, cataloging, linking, and accessing models). (27:23-24)

DSS Development.

Dialogue Subsystem. There are several ways dialogue between the user and the DSS can be accomplished. The following examples, classified according to "style", represent only some of the ways dialogue may be accomplished in DSSs (28:199). Commonly, "the dialogue component for a specific DSS will combine one or more dialogue styles" (28:204).

Question-Answer (Q/A) Dialogues. With Q/A dialogues the DSS asks the user questions, and the user answers the questions, until the DSS produces the answers required to support the user decision (28:200). The DSS determines what question(s) to ask based on the proceeding user answer(s). "If the DSS cannot 'understand' an answer, or needs additional information, clarification questions may be asked" (28:200). Q/A dialogues are most appropriate for inexperienced or infrequent users. However, the experienced or frequent user may get tired

of the same sequence of questions. The sequential questioning may also cause problems if users need to modify answers to proceeding questions (28:200).

Menu Dialogues. This style allows the user to select alternatives from a menu (28:200). "The menu dialogue seems to be quite effective for inexperienced or infrequent users who are familiar with the problem to be solved" (28:200).

Input Form/Output Form Dialogues. "Input form/output form dialogues provide input forms in which the user enters commands and data, and output forms on which the DSS produces responses" (28:201).

Database Subsystem. In building the data base management component for a DSS, one chooses a method of representing, organizing, storing, and handling data in a computer. "Most existing DSS use one (or more) of five data models. These are the record model, the relational model, the hierarchic (tree) model, the network (graph) model, and the rule model" (28:225-226). Characteristics of these models were previously discussed in the DBMS section.

> No matter what data model is used, it describes a set of objects. These objects can be either values or relationships among values. Values are represented in a data model by fields, and relationships are represented by collections of fields called records or by values in linking fields. (28:227)

A data model has three parts:

1. A collection of data structures. Lists, tables, relations, hierarchies, and networks are examples of data structures.

2. A collection of operations that can be applied (usually by the DBMS) to the data structures. Retrieval, update, combination, and summation are examples of these operations.
3. A collection of integrity rules that define the "legal" states (set of values) or changes of state (operations on values) for the data structures. Constraining all data values to be in dollars and less than 1 million is an example of an integrity constraint. (28:225)

Models Subsystem. There are three storage representations for models: subroutines, sets of modeling statements, and models stored as data (28:270).

The typical form for modeling is the storage of models as computer subroutines which are called by a main program. A second form of computer representation for models is a set of modeling statements. The third form stores models in such a way that they can be treated like a set of data and managed with a set of data management functions (28:270-271). This form of model storage begins to "merge decision models and data into knowledge representation" (28:271) which is used in expert systems. Advantages of storing models as data include:

1. It is easier to trace the operation of the model to see what it does and what it did in the past.
2. It is easier to explain or depict the operation of the model to others to facilitate communication.
3. It is easier to update the model. (28:272)

Expert Systems (ESs)

ES Characteristics. ESs are directed at distinct problems which are considered difficult and require specialized knowledge and skill (15:21). Common characteristics include:

1. The areas of knowledge have three prerequisites: the domain of application is well-defined and has a narrow scope; there is at least one human expert in the area; and the expert is able to articulate this knowledge and explain the methods of applying it.
2. ES employ heuristic problem solving; i.e., the results or decisions have been determined by rule of thumb or intuition instead of optimization and formal reasoning.
3. ES contain and use three different general kinds of information: task specific (that data relevant only to current ES analysis), domain-specific (the knowledge base, including problem-solving rules and data relevant to the filed), and control (the inference engine, which applies the axiomatic knowledge in the knowledge base to the task specific data to arrive at possible solutions). (15:23)

ES Structure. The structure of an ES contains two essential components (see Figure 2). The knowledge base and working memory is one part. The inference engine and all of the subsystems and interfaces constitutes the second part (16:34). The knowledge base contains the basic facts and heuristic knowledge gleaned from the human expert (2:18). The inference engine provides overall control of the system. "It establishes the method of reasoning used to match rules to data and to determine which rule should be applied next" (2:18).

ES Development. Before starting the ES development, one should examine whether the domain and task contain the necessary requirements for ES development. These requirements are that:

1. The task does not require common sense.
2. The task requires only cognitive skills.
3. Genuine experts exist.
4. The experts can articulate their methods.
5. The experts agree on solutions.
6. The task is not too difficult.
7. The task is not poorly understood. (33:129)

ES Structure

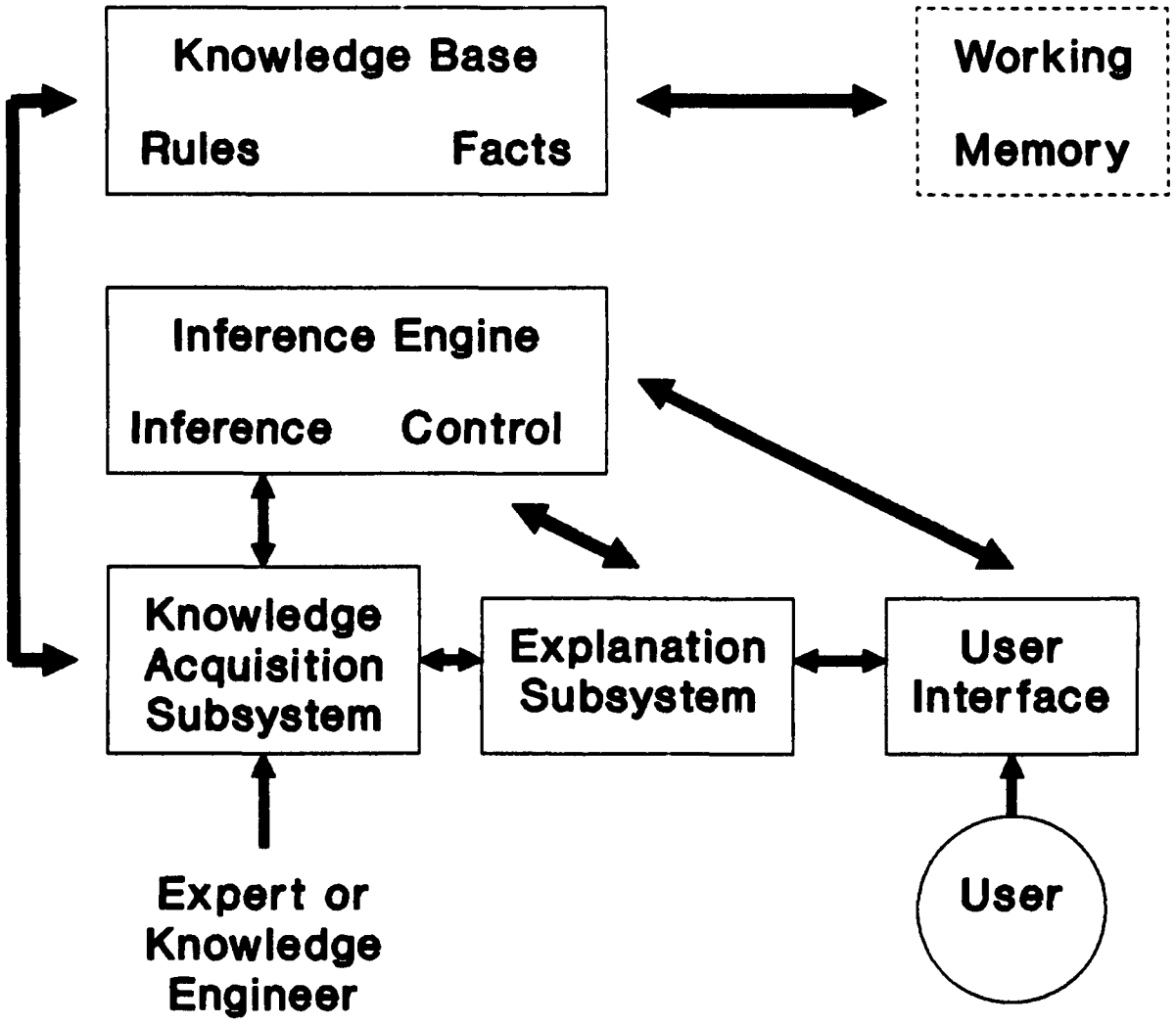

Figure 2. ES Structure (16:34)

Characteristics that make the use of ES appropriate include that the:

1. Task requires symbols and manipulation.
2. Task requires heuristic solutions.
3. Task is not too easy.
4. Task has practical value.
5. Task is of manageable size. (33:132)

Once determining if the task in question meets necessary requirements and has appropriate characteristics, development of a prototype system begins. The major steps in developing such an ES prototype involve:

1. Learning about the domain and task.
2. Specifying performance criteria.
3. Selecting an expert system building tool.
4. Developing an initial implementation.
5. Testing the implementation with case studies.
6. Developing a detailed design for a complete expert system. (16:201)

Learning About the Domain and Task. This step begins with an intensive effort to learn everything possible about the domain and task of the project. Usually this involves reviewing documents and books "to become familiar with the problem domain before beginning an extensive interaction with the expert" (16:202). After a review of available literature, the problem is discussed with the expert to define the task more precisely. When possible, the reasoning processes of the expert are described in "rules-of-thumb" steps (16:202). "The acquisition of knowledge from experts is often referred to as the most complex and time-consuming component" (23:15) of ES development. Extracting knowledge from the expert can be accomplished using the direct method or the indirect method.

The direct method extracts knowledge by interviews, questionnaires, observations, thinking-out-loud protocols, interruption analysis, drawing closed curves, and/or inferential flow analysis and relies on the experts' abilities to articulate their thinking processes (24:153). Whereas, the indirect method does not rely on the expert's abilities to articulate (24:153). Information is assimilated by collecting other behaviors, such as:

> ...recall or scaling responses from which the analyst can make inferences about what the expert must have known in order to respond the way he/she did. Indirect methods include multidimensional scaling, hierarchical clustering, general weighted networks, ordered trees from recall, and repertory grid analysis. (24:153)

Specifying Performance Criteria. This step involves determining what product will be expected from the ES.

Selecting an Expert System Building Tool. As the overall knowledge structure of the task and the inference strategies used by the expert to manipulate the knowledge become clear, the choice of which existing ES tool to use to develop a prototype will be decided (16:203).

Developing an Initial Implementation. This stage involves encoding the expert's knowledge into the ES's knowledge base. Harmon and King present five different approaches to encode the facts and relationships that constitute knowledge. These include semantic networks, object-attribute-value triplets, rules, frames, and logical expressions (16:35).

A semantic network is a collection of objects called nodes connected together by arcs or links. Nodes are used to represent objects and descriptors. Objects may be physical objects or conceptual entities such as acts, events, or abstract categories. Descriptors provide additional information about objects. Links are used to relate objects and descriptors. Flexibility is a major advantage of this approach because new nodes and links can be defined as needed. However, it is difficult to handle exceptions with the semantic network approach (16:35-37).

With the Object-Attribute-Value Triplets scheme, objects may be physical entities or conceptual entities. Attributes are general characteristics or properties associated with objects. The value specifies the specific nature of an attribute in a particular situation (16:38).

Rule based systems can represent a single fact or a series of related facts. "Rules are of the form: If A, then B" (2:10). There are two reasoning mechanisms:

> In "data driven" or "forward chaining", the system attempts to reason forward from the facts to a solution. In "backward" or "goal-driven" chaining, the system works backwards from the desired solution to find facts which support the solution. (2:11)

"A frame is a description of an object that contains slots for all of the information associated with the object" (16:44). The "frames resemble miniature data bases which are hierarchically ordered" (2:11).

Logical systems contain statements that are either true or false. Logic is used to "assert facts that are represented graphically by overlapping circles" (i.e. Venn diagrams) (16:47).

Testing the Implementation with Case Studies. Once the prototype is built, it should be tested on a variety of case studies. The tests are conducted to make sure "formalism used in representing the expert's knowledge are adequate to the tasks posed by the cases" (16:203).

Developing a Detailed Design for a Complete ES. After the prototype is functioning satisfactorily, one assesses what will be involved in developing a full-scale system. The original choice of representing knowledge in the knowledge base, and performance criteria are critical to determine what refinements may be required (16:203).

Comparison between DSS and ES

Similarities. Both DSS and ES are generally designed using an iterative or prototyping approach. With this approach one uses a step-by-step approach in the development process (30:148). An iterative or prototyping developmental approach is used with DSSs for three primary reasons:

1. It allows a high degree of user involvement.
2. It allows the system to evolve and adapt to the needs of the user, providing flexibility.
3. It provides usable decision support in the early stages. (15:25)

An iterative or prototyping developmental approach is used with ESs because "it allows the knowledge base to be refined and

expanded so that the ES can progress toward higher levels of performance" (15:25) and because "this approach allows the expert to interact directly with the system, playing the role of both expert and end-user" (30:148).

The fundamental goal of DSS and ES is basically the same; they want to improve the quality of the decision. However, "their underlying philosophies and objectives are different" (15:24).

Differences. There are several fundamental differences between DSSs and ESs as shown in Table 1.

fdre4Table 1. The Differences Between DSS and ES

	DSS	ES
Objective	Assist human	Replicate (mimic) human and replace
Who makes the decision?	The human	The system
Major orientation	Decision making	Transfer of expertise (human-machine-human)
Query direction	Human queries the machine	Machine queries the human
Clients	Individual and/or group users	Individual user
Manipulation	Numerical	Symbolic
Problem area	Complex, integrated, wide	Narrow domain
Data-Base	Factual knowledge	Procedural and factual knowledge

(30:141)

Integration of ES and DSS

ES and DSS integration may be accomplished either by integrating ES into DSS components or by integrating the ES as a separate component in the DSS (31:125-129).

ES Integration into DSS Components. "Theoretically, one can add an ES (or several ESs) to each component" of a DSS (31:125). This method views ES(s) supporting the DSS (see Figure 3). Discussion of ES's interaction with the DSS components follows.

An ES can interface with the database component in two ways.

> First, the ES can be used to improve the construction, operation, and maintenance of the DBMS. Second, the DSS can provide the ES with essential business data. (31:125)

An ES could make the DBMS more user friendly and more efficient to operate and maintain by manipulating symbolic information and using terms familiar to the user (31:125-128).

ES as a Separate Component in the DSS. An ES may also be integrated as a separate component of DSS (see Figure 4). There are several possibilities for an integration of this type. First, the ES output may be used as an input to a DSS:

> For example, the ES can be used during the intelligence phase of problem solving to determine the importance of the problem or project and to identify the problem. Then the problem is transferred to a DSS for possible solution. (31:128)

Second, the DSS output may be used as an input to a ES:

> In many cases the results of a computerized quantitative analysis provided by a DSS are forwarded to an individual or group of experts for the purpose of evaluation. Therefore, it would make

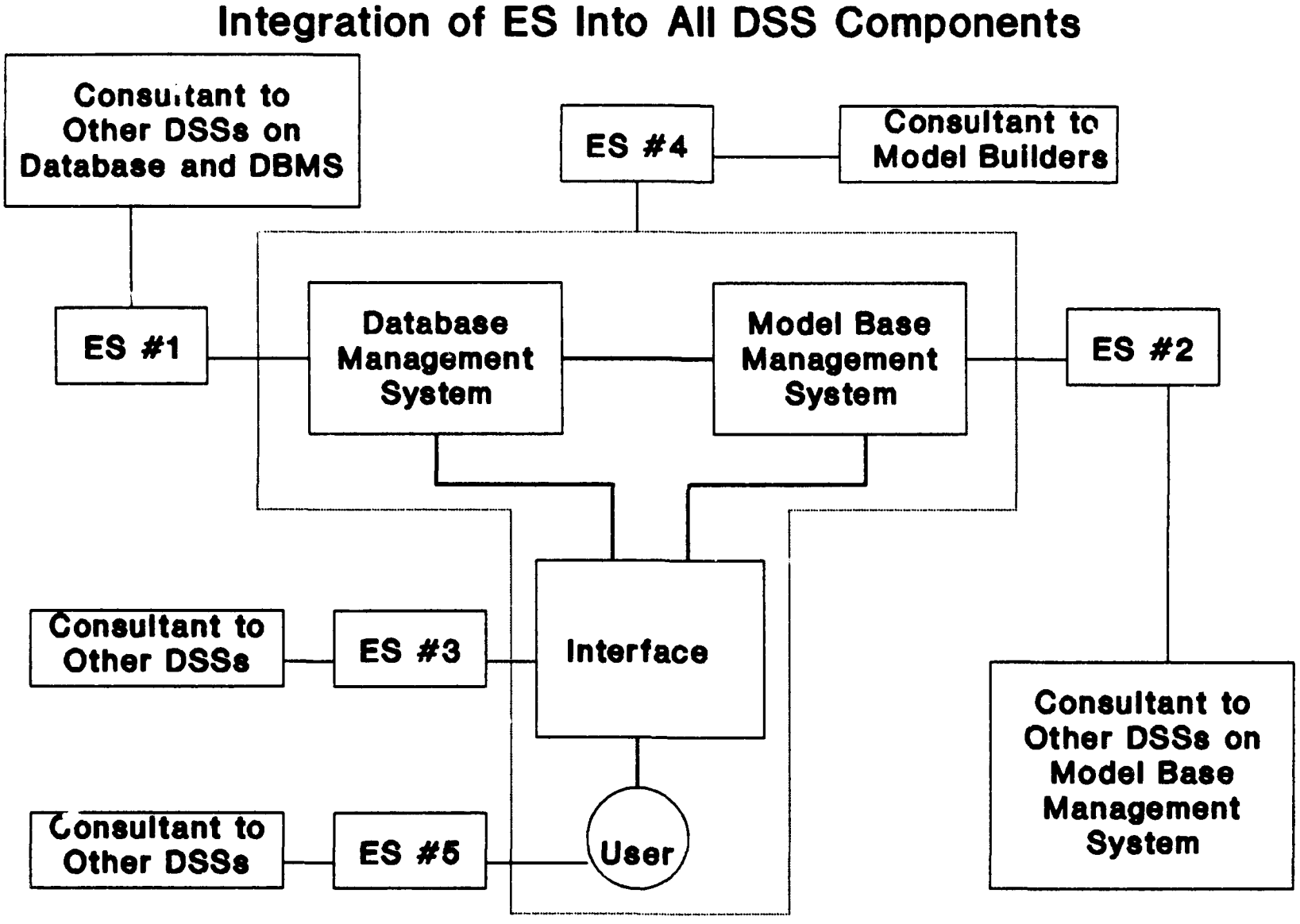

Figure 3. Integration of ES Into All DSS Components (31:125)

ES as a Component of DSS

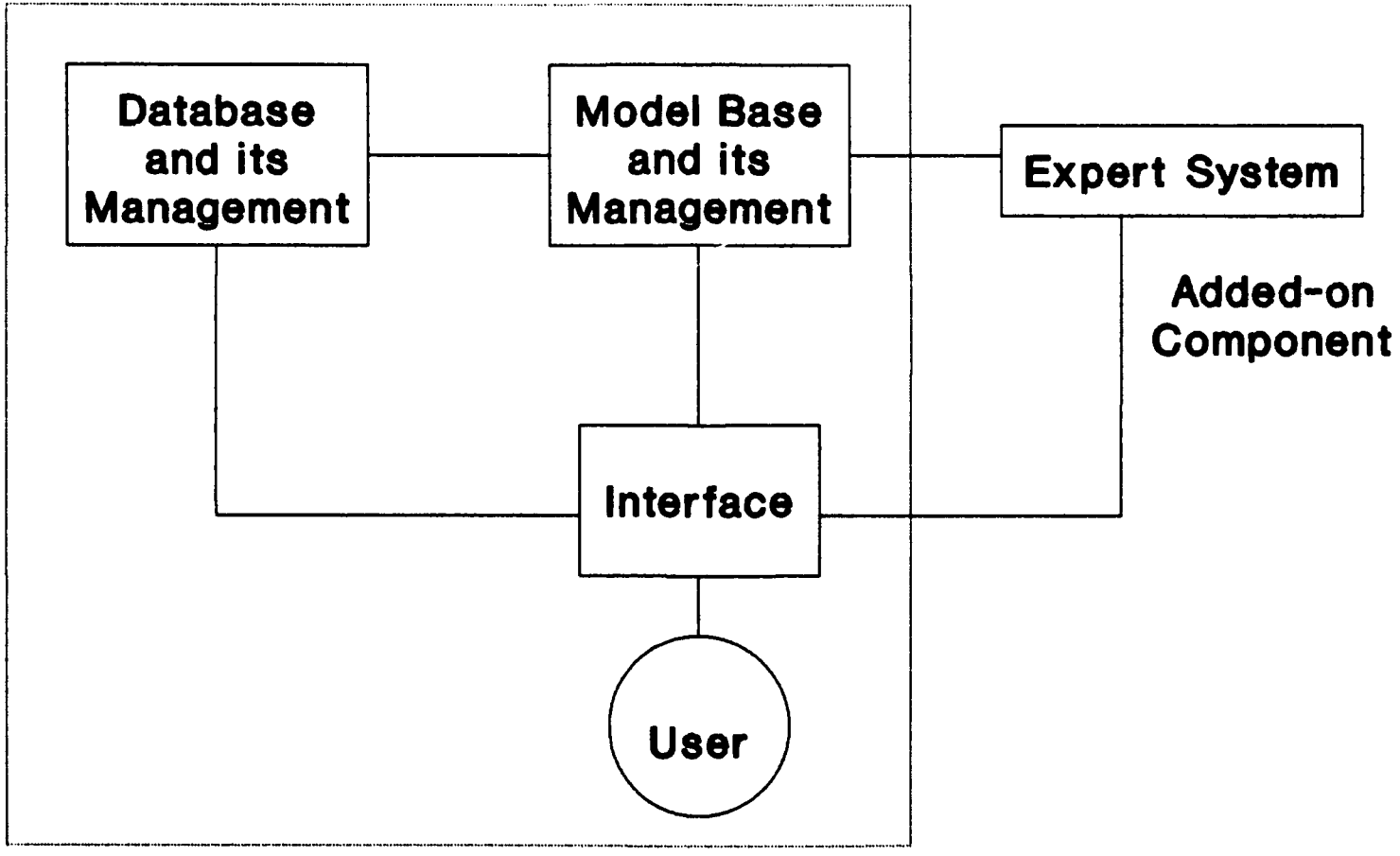

Figure 4. ES as a Component of DSS (31:129)

> sense to direct the output of a DSS into an ES which would perform the same function as an expert whenever it is cheaper and/or faster to do so (especially if the quality of the advice is also superior). (31:128)

Examples of Integration. Applegate et al. have developed and implemented a knowledge-based planning system that "integrates data management, model management and process management systems within a group decision support system environment" (5:21). The system, called the PLEXSYS Planning System:

> ...combines advanced microcomputer technology with an understanding of the knowledge requirements for organization planning to enable the elicitation, representation, storage, and management of planning information. (5:37)

Shane et al. have developed a "consulting system that provides advice for selecting an investment portfolio for an individual" by integrating two ESs with a DSS (26:79).

Combining KC-10 SA Management with DSS and ES Technology

KC-10 SA management contains complex problems which present an opportunity to see to what extent a computer system can be developed to help logisticians with their decision-making. The SA management problem area contains features that can be addressed by either a DSS or an ES. Some areas of SA management are more applicable for a DSS and some are more applicable for an ES. Separately, however, neither system would adequately cover the SA management realm.

As discussed earlier, the domain and task of a problem area should meet certain necessary requirements and have appropriate characteristics for ES development. The KC-10 SA Management area satisfies the requirements and contains the characteristics for ES development. The task is explainable by an expert in "if, then" rules and does not require common sense to preform. The task is also complex enough to warrant computer help but manageable enough to accomplish.

Development of DSSs are not limited by characteristics of the problem domain. However, in order for a computer system to be classified as a DSS, the system must have a user interface, a model and a database. The model's characteristics should allow the user to evaluate alternative solutions. This is more easily imagined as permitting the user to ask the computer "what if" type questions. In the case of the system proposed for SA management, the segment of the system which outlines the SA paperwork completion dates qualifies as a DSS. The system questions the user as to how many days they think each step in the SA process will take for a particular SA then displays the milestone date schedule as a result of the user's inputs. Alternative schedules can be evaluated by changing the original inputs.

Summary

The purpose of Chapter II was to present background information on the characteristics of DBMSs, DSSs, and ESs and

literature related to the development of these systems in order to provide a better understanding of how to build and test a system integrating the three technologies.

The material contained in Chapter II formed a basis for approaching the SA management problem area. The literature review suggests that it is possible to integrate DSS and ES and the characteristics of each system appear to be capable of being applied to the SA management problem area to develop a system which might address different aspects of SA management. Chapter III discusses the specific methodology used to develop the integrated system prototype as a result of this research.

III. Methodology

Methodology Overview

This chapter explains how the research problem was addressed using findings from a literature review, and by applying a combination of descriptive and experimental research designs. Descriptive research was conducted by interviewing an expert of the KC-10 SA process to collect the rules used in constructing the knowledge base portion of the system. An experiment was conducted to evaluate the effectiveness of the completed prototype in assisting KC-10 logisticians with the decision-making processes associated with managing KC-10 SAs.

Justification of Method

Prior to development of the prototype system, a comprehensive literature review was required to obtain the necessary knowledge to determine whether the research problem was a suitable domain for an ES, DSS, DBMS, or some combination of these systems. The literature review also examined the mechanics of how to integrate DSS and ES technologies. The findings of the literature review are found in Chapter II.

The system development stage of this research employs descriptive research. This is the stage when knowing who, what, where, when, how and how much is important (14:60). The most effective means of obtaining this information is by interviewing (14:160-161). One of the advantages of interviewing is: "in the

depth and detail of information that can be secured" (14:160). This will be critical in the system development. The capability of the expert portion to determine the next stage in the SA process depends on the accuracy of the knowledge system in depicting the individual steps of the SA process. Emory comments further:

> The interviewer can also do more things to improve the quality of the information received than with other methods. Interviewers can note conditions of the interview, probe with additional questions, and gather supplemental information through observation. (14:160)

The major disadvantages with interviewing are the time and money involved (14:161). However, since the developed system only employed extracted information from one expert, these costs were relatively small. So, in this research the advantages outweigh the disadvantages and interviewing was the method used to extract information from the expert.

In order to minimize the time burden on the expert and to have something to start with, estimated steps of the "normal depot level" SA flow where outlined before interviewing the expert. The first interview with the expert was conducted to verify the estimated "normal depot level" SA flow developed by the researcher, to determine what variables caused differentiation from the "normal depot level" SA flow and to complete outlines of flows differentiating from the "normal depot level" SA flow. The expert determined the variables causing differentiation included whether or not the SA will be

incorporated at depot or base level, whether kit costs are involved or not, and, with depot level cases, whether or not there are installation costs associated with the SA. With the variables identified, the expert worked with the researcher to outline six different SA flows (Appendix B). Several subsequent telephone interviews were required to clarify the extracted information from the first interview.

Validating the integrated system employs experimental research. This stage considers whether the integrated computer system can determine the next stage in the SA process and provide paperwork completion dates for SAs as well or better than KC-10 logisticians. In discussing experimental design, Emory states:

> Experimental design is appropriate when one wishes to determine whether certain variables affect other variables in some way. Experimentation provides the most powerful support possible for a hypothesis of causation. (14:60)

System Development

The next research stage consists of developing the integrated computer system prototype. The three main development phases include the expert portion, the decision support-database portion and the integration of the expert portion with the decision support-database portion.

The Expert Portion. The major steps involved in developing an expert system are detailed in the literature review. These steps include: learning about the domain and task, specifying performance criteria, selecting an ES building tool, developing

an initial implementation, testing the implementation with case studies, and developing a detailed design for a complete ES (16:201). Since this research intends to integrate an ES with a DSS, the last step will be the integrated system. Testing the integrated system will entail a formal experiment which is discussed later in this chapter.

The Domain and Task. KC-10 SA management is the system domain. Developing a system to determine the next step in the SA process and to track SAs throughout the process constitute the system task. In order to acquire the necessary knowledge to encode in the knowledge base, selection of an expert was required.

The Expert. Based on personal knowledge of the individual by the researcher, Ms. Pamela R. Russell was selected as the KC-10 SA expert. The selection was confirmed by the Deputy Chief of the KC-10/C-9 System Program Management Office, Mr. Gary R. Davis as the office expert of the SA process.

Ms. Russell started work at OC-ALC in 1971 as a GS-02 Key punch operator. In 1978, she became a GS-05 Trainee in Technical Data Management. Through demonstrating her capabilities for more difficult and demanding responsibilities, in five years she was promoted to the GS-11 Lead Technical Data Specialist. She oversaw all aspects of technical order management of engines (in and out of acquisition), B-52, KC-135R (Re-engine), and KC-10 systems. In 1985, Ms. Russell transferred to the KC-10 System Program Management Office. She worked with Aeronautical System

Division (ASD) prior to program management responsibility transfer (PMRT) to learn and maintain configuration of the KC-10. After PMRT, she implemented the OC-ALC configuration process by tailoring ASD procedures and ALC regulations. This involved working with the various support organizations, who had never worked with an aircraft with the combination of commercial and Air Force unique systems, and training them on the special characteristics of the KC-10 SA process. Ms. Russell retained configuration control responsibility, in which the SA process is the method used to manage configuration control, from 1985 to October 1986. Throughout the next three years, although she did not have overall configuration control responsibility, she remained an invaluable consultant with SA issues. As of October 1989, Ms. Russell was placed in charge of configuration control. She is considered the resident expert of the SA process by her boss and peers in the KC-10 System Program Management Office.

Interviews with Ms. Russell were conducted, in person and by telephone, to extract her knowledge of KC-10 SA management.

Performance Criteria. The ES is expected to reach the same conclusions as the expert for six out of six specified cases.

ES Building Tool Selection. Encoding the knowledge base with the expert's knowledge and problem solving techniques, also requires selection of an expert shell. The literature review explores the different expert system development techniques. Knowledge based rules constitute the development

technique and VP-Expert the shell employed in this research. Designed and coded by Brian Sawyer, VP-Expert provides the inference engine, the user interface, and commands required to create a working expert system. It uses English-like rule construction and a built-in editor. It was affordable, and the availability of an Air Force Institute of Technology (AFIT) class to learn the mechanics of how to use it, also made it an attractive choice.

Initial Implementation. The prototype design was a step-by-step development process using the rule-base method to represent the expert's knowledge. Through interviews with the expert, the criteria which differentiate the flow process of a SA was determined. Then, based on these criteria, the ES outlines the separate process flows. The ES guides the user through each step of the particular flow by asking a series of questions. The questions basically ask the user if they have determined whether or not the SA has been processed through each step. Sometimes the logistician is required to accomplished a task and sometimes the ES requires the logistician to check with another person to determine if the step has been completed. If a step has been accomplished, then the ES asks a question about the next step. It continues in this matter until it determines the SA has completed all steps of the process and is ready to be incorporated on the aircraft. From the time the SA is beginning to be accomplished to where it has been completed on all the applicable aircraft, the SA is tracked by a configuration control

system developed and implemented by the contractor. Therefore, the system developed as a result of this research follows the SA process up to the point where incorporation is followed by the contractor developed system. If at any time during the logisticians' interaction with the system the logisticians answer that they are not sure if a task has been accomplished, or answer no, then, the ES tells the logistician what they should do next. If after determining what the next step should be the logistician wants to change the status recorded in the database, the ES provides easy access to changing the information in the database. In order not to inconvenience the more experienced logistician, the ES system also provides a means to update database information without first going through each step in the SA flow process. In addition, the system provides a means for each logistician to add new SAs to the database information, correct existing SAs, and delete completed or non-appropriate ones.

Testing the Implementation. Accuracy tests conducted by the researcher and the expert involved reviewing the rules and facts to insure the thought processes of the expert were accurately represented in the expert system.

The Decision Support-Database Portion. The major steps involved in developing this portion include; building the dialogue, model, and database subsystems, and verifying the resulting system.

DSS Dialogue Subsystem. Recall from the literature review that the dialogue subsystem is the interface between the

user and the DSS. "The dialogue component presents the DSS outputs to the users and collects the user inputs to the DSS" (28:198). To accentuate "user friendliness", the user interface subsystem is an ES developed to guide the user through a series of questions. This style has been chosen because it requires less user effort; which may encourage user utilization of the system (26:89).

DSS Database Subsystem. The database subsystem is shared by both the DSS and the ES. The information stored is the responsible Program Manager (Logistician), the SA type and number, current status, and receipt date.

DSS Model Subsystem. In order to help logisticians determine when a SA may start being incorporated on aircraft, this model provides a means for the logisticians to evaluate alternative schedules. The impact that delays have on the scheduled incorporation are displayed to the logistician. Model representations are be stored as data in a Quattro spreadsheet (25).

Verification. Verification of the DSS was continually checked with the proposed iterative (step-by-step) developmental approach. The system was developed in several independent modules and each separate module was checked for accuracy (Chapter IV details the verification process).

Integrating ES and DSS. Integration of the ES and DSS was accomplished by providing an ES interface to the DSS portion of the system. A copy of the users guide for the integrated system

in presented in Appendix C, and programming of the integrated system is included in Appendix D.

Validation of the Integrated System

To test whether the integrated computer system can determine the next step in the SA process and provide status of a particular SA as well or better than KC-10 logisticians, an experimental field test was conducted.

SA Scenarios. Six SA scenarios, one from each of the six SA flow processes, were written by the researcher for use in the test comparing the accuracy of KC-10 Program Managers operating the developed integrated system against Program Managers without the system (Appendix E). The scenarios describe SA variables, provide the date of receipt, and indicate current status of the SA in the SA process. Each scenario then asks; (1) what the next step is for that particular SA, (2) estimate how many days it will take to complete the next step (within 5 days), and (3) estimate the date the SA will start to be accomplished on aircraft (within 1 month). These questions are designed to test the KC-10 logisticians' and the computer system's ability to answer the scenario questions. These scenarios were designed by the researcher, reviewed by the thesis advisor and further validated by the expert.

Criteria for Sample Selection. The small size and vast difference in SA experience in the KC-10 logistician population influenced the researcher to take stratified samples for the

validation test. Although: "randomization is the basic method by which equivalence between experimental and control groups is determined" (14:76), a logistician's capabilities normally increase with experience. And, since the test compares abilities between two small groups: "it is risky to depend upon random assignment alone to assure equivalency" (14:123). So, the KC-10 Deputy Branch Chief ranked the logisticians, based on the their knowledge of the SA process, and the two tested samples were made to balance SA process experience in both groups. "Stratification is almost always more efficient statistically than simple random sampling and at worst is equal to it" (14:307).

Testing Procedures. The test was designed as a Post-test-only control group, which is an example of a true experimental design. The design is:

Group Assignment	Treatment	Observation
R	X	O1 (Test Group)
R		O2 (Control Group)

(14:122)

The only difference is instead of randomly assigned groups (designated by the R), the groups were stratified, as discussed in the proceeding section.

The test group participants were briefly trained to use the software and used the computer system to answer the scenario questions. The control group answered scenario questions without the computer system. "The experimental effect is measured by the difference between O1 and O2" (14:122). But, in order to make

sure the difference between O1 and O2 is due to the computer system and not due to an imbalance in the compositions of the groups, Wilcoxon Rank Sum non-parametric tests were performed on several different variables of the groups. These variables included the participants age, years experience at OC-ALC, years experience as a KC-10 Program Manager, years experience with KC-10 SAs, knowledge of the KC-10 SA process and experience with computers (see pages 55-56). If statistical differences were found to exist between the two groups because of one of these variables, the difference between the accuracy of the two group's answers could have been perceived as due to one group containing more people with either more knowledge in the subject area or more experience in using computers than the other group.

Criteria for Analysis. Comparison of the two groups were made on differences in means by the Wilcoxon Rank Sum non-parametric test. The goal of this statistical analysis is to establish whether there is a significant difference between the accuracy of the two group's answers.

Synopsis

Chapter III presents, identifies, and justifies the methodology used to develop an integrated expert-decision support-database system which determines the next stage for a particular KC-10 SA and provide status of all SAs. Chapter IV provides additional details as to how the system was verified to ensure its accuracy prior to the test.

IV. Verification

Verification Overview

Several iterations of the KC-10 ES-DSS-DB system prototype were developed before actual test validation occurred. This chapter describes the six-and-a-half month evolution process of the developed integrated system. Throughout the entire six-and-a-half month process, there were numerous telephone interviews with the expert. Documentation of all these telephone interviews would be extremely difficult and monotonous. Suffice it to say that any doubts the researcher had in the service action (SA) flows were resolved by telephone interviews with the expert.

Expert System

The first interview with the expert, discussed in Chapter III, occurred in December 1989, prior to the researcher's enrollment in an AFIT course, LOGM 592, titled "Artificial Intelligence Applications In Management." Using the knowledge extracted from the expert, the first system prototype outlined the "normal depot level" SA flow. The system guides the user through the steps of the SA flow with a series of questions aimed at determining how much of the flow had been completed. When the user reached a step in the process that had not been completed, the system informed the user what actions should be accomplished to determine the status of the SA and to maintain SA processing. At this development point, the expert system (ES) was not

designed to interact with a database, so it was generic for all "normal depot level" SA flows. The ES was checked against the "normal depot level" SA flow outline developed in December 1989 and confirmed with telephone interviews with the expert, to make sure the system accurately presented the "normal depot level" SA flow. The next phase of system development involved incorporating the SA flows which differed from the "normal depot level" SA flow.

After the "normal depot level" SA flow was developed, the researcher used the variables determined by the expert to cause divergence from the "normal depot level" SA flow, (described in Chapter III), to develop five other SA flows. Also developed, was a module that asked the user to identify the specific SA processing type by answering questions concerning the variables. After the user identified whether or not the SA was to be accomplished at depot or base level, if there were kit costs involved, and, in the case of depot level SAs, if there were installation costs associated with the SA, the system "knew" which SA flow steps to guide the user through. From describing the system's depiction of the SA flows to the expert over the telephone, the expert did not suggest any modifications to the presentation of the SA flows. The expert was satisfied that the SA flows were accurately presented. Again, this was a generic type system because it did not interact with a database. The next major prototype iteration involved changing the developed system so it interacted with a database.

In order for the ES to be able to display recorded status of a particular SA required a database connection. The database structure was modeled after the database structure currently used in the KC-10/C-9 System Program Management Office. Database fields used included: the Program Manager's initials, SA Type, SA number, SA status, and receipt date. The existing ES was modified so it asked the user to choose a particular Program Manager from a provided list. To make a selection required the user to move the curser block over the particular Program Manager's initials and press the ENTER key. After the Program Manager had been identified the system displayed the SAs from the database which had been recorded as belonging to that particular Program Manager's responsibilities. Again, the user was required to select which particular SA's information to extract from the database by moving the curser block over the SA number and pressing the ENTER key. Once the Program Manager and SA number had been identified, the system displayed to the user the last recorded status of that particular SA. Next, the system asked the user the questions concerning the SA flow variables. Then, based on the user's answers, it asked the SA flow questions to guide the user through the SA flow steps for that particular SA. The researcher developed a sample database to test the system's capability to display expected information from the database. This test was successful; the data were correctly displayed by the system.

In addition to the six SA flow process, the capability to add SAs to the database and change the recorded SA status in the database were also added. And, in order to allow the user to choose from among the options: add SAs, change status, or display status and go through the SA processing steps, an ES menu module was added to the basic ES system. At this time in the development process, the developed system required the full 2.0 version of the VPExpert shell. The student version of VPExpert could not operate all the different modules as one connected system.

A copy of the ES system, at this development stage, was given to the expert for verification. Due to limited funding, the expert and the researcher were not able to physically work together to review the ES system at this point. So, it was difficult to determine the level of effort the expert expended verifing the system. As a result of the expert's review, there were not any additional modifications to the SA flows at this time. Additional capabilities to modify database information were added in the next system iteration. Also in this third major iteration, the ability to estimate paperwork completion dates for different steps in the process was developed.

DSS Component of System

Next, additional programming was developed and integrated with the existing ES system. As a result, the first KC-10 ES-DSS-DB integrated system was completed. This additional

programming was developed with the assistance of Captain James Heatherton.

Added to the ES part of the system was a module developed to give the user the ability to correct information stored in the database. Besides being able to change the status, this module allows changes in the other database fields (Program Manager, SA Type, SA Number, and Receipt Date). This module was developed to give the user a way to correct typing mistakes which may have occurred while adding SAs to the database and to change the Program Manager's initials whenever responsibility for an SA is assigned.

To provide a means for the user to delete unwanted SAs a menu was developed in MS Dos which brought dBaseIII+ to the screen. At this point in the development, no programs where developed in dBaseIII+; only the capability to use dBaseIII+ was presented.

The additional capability to provide estimated paperwork completion dates was developed using Quattro, a spreadsheet software package (25). After the user identified a SA flow type, the Quattro module of the system presented different steps of that particular SA flow, and calculated milestone dates based on the SA receipt date. This portion also allows changes to the processing times for each step so that the user can determine the impact of each change on the overall processing time. Processing times for each step were obtained from a telephone interview with the expert.

Additional Modifications Prior To Site Visit

Before taking the system to the KC-10/C-9 System Program Management Office, it was reviewed by the researcher's thesis advisor, LtCol Larry Emmelhainz, and reader, LtCol Frederick Westfall. As a consequence, several modifications were implemented to increase the application, clarity and user friendliness of the system.

A continuance check for each of the ES modules was developed to make sure the user was in the desired module. This way the user did not have to work through a module if they did not want to continue. Wording of some of the menu items as well as other system displays were changed to clarify the system. Two dBaseIII+ programs were developed. One helps the user delete a SA from the SA database. The other dBaseIII+ program lists all SAs in the database by Program Manager's initials, SA type, SA number, and SA status. A separate dBaseIII+ menu was also programmed so the user could easily choose which dBaseIII+ program to perform. The Quattro portion of the system was modified to improve internal documentation and program integrity. More directions were presented to the user and the Quattro module was also modified so the user could not change any entry in the spreadsheet except the number of processing days for each SA step. A concerted effort was made tc make sure the steps displayed in the spreadsheet portions matched the steps questioned in the ES portions.

After all of the above modifications were incorporated into the system, the system was tested by an outside observer, Mrs. Catherine Murray. As a result of this particular test, wording of some of the system displays were modified to increase clarity.

Just prior to the site visit, the researcher called the expert to verify the Program Manager's initials included in the system provided list. As a result of this conversation, instead of the system providing a list of Program Manager's initials to choose from, the system asks the users to type in their intitals. This modification was incorporated so that as the population of Program Managers change new members will also be able to save and extract SA information to and from the database. The expert also informed the researcher that the KC-10/C-9 Office only had monochrome screens with their computers, so the developed colorized version of the system was modified so to be appropriate for monochrome screens.

Additional Modifications At Site Prior To Validation

Once the researcher and expert nad a chance to physically work together to verify the system, additional modifications were incorporated in the system. Some SA flow processing details had changed since the first interview with the expert and had not been reported to the researcher for incorporation in the system. Therefore, the entire system was reviewed and verified by the expert. And, specific portions were also verified by the different OC-ALC offices involved in the SA process (MMAR, MMAP,

PMWBB, and the ACO), and the KC-10/C-9 System Program Management Office Deputy Branch Chief. As a result of this reviewing process, changes were made to the SA flows in the ES portions and the number of processing days for some of the SA flow steps were changed in the Quattro spreadsheet portion. After the changes, a final verification was conducted by the expert and the researcher. Validation of the system began after the expert was satisfied with the performance the system.

The analysis of the effectiveness of the KC-10 ES-DSS-DB integrated system prototype is presented in Chapter V.

Chapter V. Analysis of Results

Overview of Analysis

The purpose of this chapter is to analyze the results of the experiment conducted to assess the KC-10 ES-DSS-DB integrated system's effectiveness in determining the next step in a service action (SA) flow and estimated paperwork completion dates for the different processing steps. Test completion times were not considered a factor in the analysis. The speed at which a person determines the next step in the SA flow and estimates the paperwork completion dates was not important in testing the developed system. All test group participants completed the scenarios in approximately the same amount of time; one and one-half hours. Therefore, the participant's completion times were not part of the statistical analysis of the system. What was important was the accuracy of those decisions. As previously stated in Chapter III, comparisons of the scenario scores were made using a simple comparison of means test. The data were analyzed using the non-parametric Wilcoxon Rank Sum test option of Statistix II, an interactive statistical analysis program for microcomputers written by NH Analytical Software (29). The two test groups were also analyzed by using the non-parametric Wilcoxon Rank Sum test option of Statistix II, to determine if there were significant differences between the two test groups. Prior to analyzing the results of the experiment, actual events

that took place during the experiment and the analysis of the test groups are presented.

Experiment Events

Recall from Chapter III, that stratified sampling techniques were applied for the test experiment to ensure a balance of SA processing knowledge in the two groups. Stratification was made after the KC-10/C-9 System Program Management Office Deputy Branch Chief ranked the Program Managers based on what he believed was each Program Manager's knowledge of the KC-10 SA flow process. The person who ranked first was paired with the person who ranked last and placed in one test group. The person who ranked second was paired with the person who ranked next to the last and placed in the other test group. This procedure continued until all available Program Managers were placed into two test groups. Once the two test groups were formed, a coin was tossed to determine which group would be tested manually and which would be tested with the developed integrated computer system. After eliminating the expert, who was ranked first out of 16 people, and people on leave or on temporary duty, the ranks of the twelve people in the two groups were as shown by Table 2.

A Wilcoxon Rank Sum test showed the average rank of both test groups as 6.5. The test statistic of this test showed the value of the normal approximation with the continuity correction applied as -0.08. The continuity correction allows the

calculations to correct the variances for the small sample size so the occurrence of tied data values is properly accounted.

Table 2. Rank of SA Processing Knowledge

Computer Group's Ranks	Manual Group's Ranks
3	2
8	5
9	7
10	12
11	13
15	16
E = 56	E = 55

The null hypothesis was that the data fit a specified distribution with known parameters. In other words, the differences between the means of the two test groups are equal and there is not a significant difference between the two groups' means. The P value, which in this case was 0.6829, corresponds to the specified value of alpha that permits rejection of the null hypothesis, H_o, in the test. The null hypothesis was rejected as long as the P value was less than 0.05; otherwise, the data were interpreted as not having enough evidence to support rejecting the null hypothesis. Since the results of this test fail to reject the null hypothesis, it was concluded that the ranking of the people's knowledge of SA processing cannot be considered unequal between the two groups.

Because the KC-10/C-9 System Program Management Office continued to conduct business as usual during the testing of this system, regular scheduling of tests was impossible. The

researcher was required to catch available people throughout the three test days to perform both aspects of the experiment. Also, due to lack of available space to conduct the experiment, people performing the test manually were allowed to complete the test at their regular desks. Unfortunately, the researcher was not aware that copies of the SA flow outlines that the expert and the researcher developed in December 1989 (Appendix B) had been given to all the Program Managers. Also, the researcher failed to specify to the people performing the test manually to complete the test without outside help of any kind. Apparently, four of the six participants used the SA flow outlines and one asked a fellow Program Manager a question, instead of asking the researcher. However, use of these outlines and discussion with others are common in this work environment. The results of the tests with the Program Managers using these resources should, therefore, more closely match the results which these Program Managers would normally produce. Interruptions also frequently occurred with both aspects of the experiment.

Prior to performing the test scenarios, the participants completed a self-evaluation on their work experience and familiarity with various computer software (Appendix F). Comparisons of the responses given by the two groups of participants for several variables are summarized in the following tables:

Table 3. AGE OF PARTICIPANTS

	WITH COMPUTER	MANUALLY
under 20	0	0
20 - 29	0	1
30 - 39	0	1
40 - 49	4	3
50 - 59	2	1
60 or over	0	0

Table 4. YEARS EXPERIENCE AT OC-ALC

	WITH COMPUTER	MANUALLY
less than 2 years	0	2
2 - 5 years	0	0
5 - 10 years	0	1
10 - 15 years	0	1
15 - 20 years	1	0
more than 20 years	5	2

Table 5. YEARS EXPERIENCE AS A KC-10 PROGRAM MANAGER

	WITH COMPUTER	MANUALLY
less than 2 years	3	4
2 - 5 years	3	2
5 - 10 years	0	0
10 - 15 years	0	0
15 - 20 years	0	0
more than 20 years	0	0

Table 6. YEARS EXPERIENCE WITH KC-10 SAs &/OR KC-10 TCTOs

	WITH COMPUTER	MANUALLY
less than 2 years	3	4
2 - 5 years	3	2
5 - 10 years	0	0
10 - 15 years	0	0
15 - 20 years	0	0
more than 20 years	0	0

Table 7. KNOWLEDGE OF KC-10 SA PROCESS

	WITH COMPUTER	MANUALLY
No knowledge at all	1	0
Limited knowledge	1	2
Mediocre	2	2
Knowledgeable	1	2
Very Knowledgeable	1	0

Table 8. EXPERIENCE INTERACTING WITH COMPUTERS

	WITH COMPUTER	MANUALLY
No experience at all	0	1
Limited experience	3	2
Mediocre	2	2
Experienced	1	1
Very Experienced	0	0

Wilcoxon Rank Sum tests were perform on each of the above characteristics of the participants to determine if a significant difference in the two groups existed. The results of these tests are summarized in the following table:

Table 9. PERSONAL ASPECTS OF PARTICIPANTS

	Z TEST	P VALUE
Age of Participants	0.400	0.4145
Years Experience at OC-ALC	0.721	0.2684
Years Experience as a KC-10 Program Mgr	-0.104	0.5556
Years Experience with KC-10 SAs &/or TCTOs	-0.104	0.5556
Knowledge of KC-10 SA Processing	0.104	0.4603
Experience Interacting With Computers	0.000	0.5556

In all cases, the P value corresponding to the specified value of alpha that permits rejection of the null hypothesis, H_o, was larger than 0.05. The null hypothesis, in each case, was

that the data fit a specified distribution with known parameters. In other words, the differences between the means of the two test groups are equal and there is not a significant difference between the two groups means. Since the results of these tests failed to reject the null hypothesis, it was concluded that the two test groups could not be considered unequal based on any of the characteristics of the participants.

Analysis of the System Validation

With six people answering six scenarios, the greatest possible number of correct answers per question was 36. Table 10 summarizes the scores of the experiment:

Table 10. TEST SCORES

	NUMBER CORRECT WITH COMPUTER	NUMBER CORRECT MANUALLY
Next step in SA process	36	21*
Number of processing Days for that step (within 5 days)	36	9
Estimated Paperwork Completion Date (within 1 month)	36	5

* With aid from the SA flow charts developed in December 1989

Wilcoxon Rank Sum Test. The value of the test statistic, a normal approximation with a continuity correction, and a one-tailed P value was calculated on the test scores with the

Wilcoxon Rank Sum test option of Statistix II. Results of the test are summarized in Table 11. The "Z TEST" column shows the value of the normal approximation with the continuity correction applied. Again, this allows the calculations to correct the variances for the small sample size so the occurrence of tied data values is properly accounted. The "P VALUE" corresponds to the specified value of alpha that the test permits rejection of the null hypothesis, H_o. The null hypothesis is that the data fits a specified distribution with known parameters. In other words, the differences between the means of the two test groups are equal and there is not a significant difference between the two groups means. The null hypothesis was rejected as long as the P values were less than 0.05.

Table 11. WILCOXON RANK SUM TESTS

	AVERAGE CORRECT WITH COMPUTER	AVERAGE CORRECT MANUALLY	PERCENT CORRECT MANUALLY	Z TEST	P VALUE
Next step in SA Process	6.000	3.500	58%	2.802	0.0011
Number of Processing Days for for that step (within 5 days)	6.000	1.500	25%	2.802	0.0011
Estimated Paperwork Completion Date (within 1 month)	6.000	0.660	11%	2.802	0.0011

Since the data supports rejecting the null hypothesis, it was concluded that the answers from the population composed of people using the computer system were significantly different from the answers of people performing the test manually.

Because the manual test scores were so poor for estimating the final paperwork completion dates (one person gave 4 correct responses), further investigation of those answers are presented. Of the wrong answers, five were later completion dates than what is considered the average, based on a consensus of information from the expert, the KC-10 Deputy Branch Chief, and the other offices involved in SA processing. The later dates ranged from one-and-a-half months to five months, with an average of 3.4 months. Twenty-one of the wrong answers were earlier completion dates then what is considered the average, ranging from four months to 10 months, with an average early date of 6.4 months. One participant admitted he did not have any idea how long the SA process takes and refused to even try to answer the estimated completion date question, which accounts for 6 wrong (blank) answers. Apparently, most of the time, Program Managers expect SA processing to take less time than what is actually possible.

At the conclusion of each of the tests performed with the computer system, participants completed a post experiment critique about the system. The blank critique form is presented in Appendix G. Participants comments about the developed system are included in Appendix H, as well as comments from others who were trained on the system. Most of the comments were very

favorable. Other than the name of the system, the only other criticism was the inability to save the changed SA completion dates in the Quattro portion of the system. The desire to have the capability to save this information was anticipated by the researcher. However, programming complications with the interaction between Quattro and dBaseIII+ prevented this capability. Different software packages programmed to perform the same function as the developed Quattro portion could be utilized and possibly made able to save the changed SA completion date information.

After the OC-ALC/MMA Division Chief, Colonel Gene Korotky, reviewed the system, he called AFIT to thank the researcher for the research effort and developed integrated system (21). He would like to have the developed system adapted for the other 41 Contractor Logistics Supported (CLS) programs managed at OC-ALC.

Analysis Summary

Chapter V presented results of this research. The KC-10 ES-DSS-DB integrated system effectively increased the number of correct answers to the scenarios. Chapter VI discusses conclusions which can be made from the research.

VI. Summary, Conclusions, and Recommendations

Summary, Conclusions, and Recommendations Overview

This chapter reviews the research, discusses conclusions, and offers recommendations for future modifications to the developed system and for future research.

Summary of Research

Being able to track SAs and predict estimated completion dates for service action (SA) flow steps is important to manage the KC-10 weapon system effectively. However, the KC-10 Program Managers currently do not have the capability to predict accurately the next step in the SA flow processes or to provide estimated paperwork completion dates for the steps of those processes. The primary objective of this research was to develop an integrated computer system and determine whether or not the system could help KC-10 Program Managers better manage their SAs.

The methodology consisted of developing parts of the system, integrating those parts and then testing the completed integrated prototype. Testing of the system involved having twelve KC-10 Program Managers solve six SA scenarios. Six people used the system to answer the questions and six people answered the questions without the system. Comparisons of the results of the scenario tests, presented in Chapter V, were used to determine whether the computer helped KC-10 Program Managers.

Conclusions

This section answers the research questions presented in Chapter I.

Research Question 1. The first research question asked to what extent could the KC-10 SA process flow be determine.

Conclusion 1. It is possible to capture each step of the SA process in a computer system. The only limitation of determining the KC-10 SA process flow rests with the level of detail obtained from the people involved with SA processing and the representation of those details in the computer system. This research effort tried to capture all the details of the SA process flow, taking special precaution to make sure to note any time the SA processing responsibility changed offices. Verification of the system confirmed that each step of the SA processing flow had been addressed by the system.

Research Question 2. The second question asked what variables alter the "normal" SA processing flow.

Conclusion 2. The expert used in this research determined that changes in "normal" SA processing depends on whether or not the SA is to be incorporated at base level or depot level, whether or not the SA kits have costs associated with them, and in the cases of depot level incorporated SAs, whether or not there are costs with SA installation. Although the KC-10/C-9 Branch Chief never officially confirmed the variables determined by the expert, nether he nor any of the other logisticians using the system challenged the results as being incorrect.

Research Question 3. The third question asked to what extent could the current status of each KC-10 SA be determined by the computerized system.

Conclusion 3. Throughout the verification and testing processes, the computer system proved that it could extract status information for a particular SA from the system's database and display it to the user. The system developed with this research effort performs this function through the expert system (ES) portion of the integrated system. Whether or not the displayed status is current, depends on the user's data updating practices. As long as the user updates the status of the SA when appropriate, the system will display the current status for that SA.

Research Question 4. The fourth question asked to what extent can the management of KC-10 SAs be computerized using expert system, decision support system, and database system technology.

Conclusion 4. Different parts of the developed system address different aspects of SA management. The ES portion of the system guides users through the different steps of the different SA flows and allows additions and modifications to the KC-10 SA database. The capability to determine the next step in the SA flow for a particular SA is also enhanced by the system informing Program Managers what actions should be taken if a step has not been performed or if Program Managers are not sure whether a step has been accomplished. Therefore, Program

Managers would not be at a loss as to what should be done to keep the SA efficiently processing through the SA flow. Also, with the ES portion of the system, the capability to add or modify SAs in the database is made very user friendly. Even people with limited computer knowledge were able to change information contained in the KC-10 SA database. This feature should encourage Program Managers to keep the database information current.

The dBaseIII+ portion of the system permits users to delete unwanted SAs. This option helps users to keep the data contained in the database significant; unnecessary or unwanted data can be eliminated. The dBaseIII+ portion can also give users a list of all the KC-10 SAs contained in the database. This option displays, and is capable of printing, the Program Manager's initials, SA type, SA number, and status of all the SAs. Having a complete list of active SAs is required at management meetings to show SA activity levels and in determining Program Manager's SA responsibilities.

Estimated completion dates for the various steps in the SA flow are provided in the Quattro portion of the system. This gives the Program Managers milestone dates in SA processing and sets goals for the number of days SAs should take to accomplish each step. Users are also provided the capability to change the regular number of processing days with actual numbers of days to examine the effect of the changes on subsequent steps in the SA processing flow as well as on the final estimated paperwork

completion date. If desired, the milestone dates may also be printed so the Program Manager has a hard copy of this information.

Further listings of SAs in various compositions can also be added to the system at future dates. The developed system was built in many separate modules to enhance the capability to modify the system in the future. Additional portions may be added to any of the software package's modules used in programming the system.

By integrating ES and decision support system (DSS) technology the whole SA management realm can be computerized to enhance the KC-10 logistician's understanding of the complex SA processing procedures. The results of the experimental tests performed in this research reveal that using the system increases Program Managers' capability to predict the next step in SA processing, estimate the number of processing days for each step, as well as estimate the final paperwork completion dates for each of the six SA process types. The positive comments from the Program Managers who were trained on the system also show that they accept, and would like to use, a system like the one developed in this research.

Research Question 5. The fifth question asked once the computer system requirements are developed could the integrated computer system determine the next step in the SA process and provide estimated SA completion dates of SAs steps as well or better than KC-10 logisticians.

Conclusion 5. The experimental results of the integrated computer system indicate the affirmative. People who answered the scenario questions regarding the next step in the SA flow, estimated number of processing days for that particular step, and the estimated paperwork completion dates with the computer system, in all cases, outperformed the people who answered the questions without the system.

Without the system, 42 percent of the time Program Managers were not able to accurately determine the next step in the SA flow when presented with the last recorded step in the process. Program Managers are responsible for seeing that the SA accomplishes all required SA processing steps. Not knowing the sequential steps in the SA process greatly hinders the Program Managers' abilities to track the SA through the SA process. If problems occur in one of the steps or if the SA gets "lost", SA processing may stop until the Program Manager "finds" the SA and resolves the problems. This system prevents such processing delays from occurring.

Seventy-five percent of the time, Program Managers without the system could not provide the number of processing days that particular step should take. If the Program Manager is not aware of how long a particular step should take, the SA processing could be taking more time than necessary. On the other hand, knowing the times allow managers to track each step and to identify delays in steps which contribute to final SA completion delays.

And, in almost all cases, 88 percent, Program Managers could not provide an accurate estimate of the completion date for a SA scenario. Besides not being able to answer top management inquires as to expected dates for a particular SA incorporation, Program Managers are having problems providing budgetary estimates for particular year money. Knowing when SAs are to be accomplished on aircraft would let the Program Office better allocate their monetary resources. Over 80% of the incorrect estimates were optimistic by an average of 6.4 months. This system enables managers to accurately predict completion so that unrealistic expectations, and funding errors, are avoided.

Recommendations for Incorporation & Future Research

The integrated ES-DSS-DB system developed for this research has been recommended for incorporation by the KC-10 System Program Management Office Deputy Chief, Mr. Gary R Davis. And, after the OC-ALC/MMA Chief, Colonel Gene Korothy, reviewed the developed system, he established it as the division's configuration control standard. Colonel Korothy wants all 41 contractor logistics support (CLS) weapon systems at OC-ALC to have a computer system that helps logisticians manage contractor recommended inspections, maintenance, and modifications, similar to the one developed as a result of this research. Colonel Korothy, in a telephone discussion with the researcher (21), said that there is an urgent need for efficient configuration control on all the CLS programs at OC-ALC and he would support further

work in this area. Some of the CLS programs currently have no concrete method employed to help manage contractor recommended modifications to the weapon systems. In the future, either a more generic computer system could be developed to manage a number of these CLS programs or a specific detailed computer system, similar to the one developed in this research, could be developed for any one of the weapon systems.

Also, because the processing of SAs historically takes a year to a year-and-a-half to complete, research has not been performed on the effects the developed system has on the processing times. Future research could be conducted to determine if an integrated system like the one developed in this research decreases SA processing and allows modifications to occur quicker on aircraft. Once the logisticians have the SA process under control, because of their increased knowledge, their capability for a higher level of SA management is possible. This higher level management may allow them to streamline the SA process and increase the speed at which SAs are incorporated on aircraft.

Recommendations for Future Modifications

The comments from the Program Managers trained on the developed integrated system indicated a desire to have the capability to save Quattro modifications. When Program Managers make changes from the displayed number of processing days to show actual number of processing days, they would like to be able to

recall the changes they entered, for that particular SA, whenever they want to. This would eliminate the need to re-enter the modifications when further consultation of this portion of the system occurs. The researcher anticipated Program Managers' wanting this capability and did attempt programming the system to provide this option. However, the interaction of the software used in the developed system would not permit this type of interchange. Other spreadsheet software packages with this capability could be programmed to replace the Quattro portion currently employed in the system.

The KC-10 System Program Management Office's Deputy Branch Chief would like the capability to list SAs by Program Manager. Another dBaseIII+ program could be developed and added to the system to provide this listing. Any other SA listing configuration which may be required at future dates can also be programmed in dBaseIII+ and added to the developed system.

The KC-10 System Program Management Office's Deputy Branch Chief would also like the capability to list SAs with late SA step completion dates. This capability might be added with an ES module which saves each SA step completion date to the database and dBaseIII+ program listing the SA with late dates. Another possibility might be to program a dBaseIII+ program to perform both aspects; collecting completion dates for each step and providing a list of the SAs with late dates. Or, perhaps a different spreadsheet software program could be used to display

SA step completion dates, save actual completion dates, and interface with a database management system.

Lessons Learned

When this research began, there were questions as to how effective a computerized management system would be with integrating a number of different software packages. And, since this research has developed a system which incorporates MS Dos, ES, Quattro, and dBaseIII+ together into one system, shows it can be done, but not without some degree of difficulty. Especially difficult is the transfer of dates from one software program to another. One software saves dates in a way that other software packages cannot use or recognize. Before selecting the software for a project, it is especially recommended to check the date exchange compatibility of the software packages. Also important is to check the way software packages save blank date fields. This can also present some undesirable results, such as preventing the program from operating as required.

When developing an ES program, try to have the expert you are going to use located close geographically. It is extremely difficult for the expert to visualize what the developing system looks like. Frequent consultations and demonstrations of the system with the expert will increase the chances of the system representing the expert's extracted knowledge and improve the system's operation in a more timely manner.

Final Notes

The integration of ES and DSS technology is not as yet a common occurrence in computer programming. Today's complex working environments require management proficiency in a wide range of applications. By integrating ES and DSS technology, computer systems can be greatly enhanced to include a wider range of management requirements and increase managers' management capabilities. More attempts at integrating the two technologies will increase the knowledge needed to build successful computer systems to meet the needs of today's and tomorrow's managers.

Appendix A: Definitions & Acronyms

Administrative Contracting Officer (ACO) - A government contracting officer whose main task is to administer previously awarded contracts, making certain that the contract provisions are carried out in performance. (1:Ch 4-page 17)

AFIT - Air Force Institute of Technology

Airworthiness Directive (AD) - An airworthiness directive is issued to all concerned agencies by the Federal Aviation Administration (FAA) in response to a safety-of-flight problem occurring in-service for a specific type of aircraft. The directive must be followed for commercial aircraft as they specify the conditions and limitations if any, under which the aircraft type may continue to be operated. The AD carries a compliance data plus flight hours, or cycles, or both, and must be complied with to maintain the FAA Airworthiness Certificate. (20:5)

All Operators Letter (AOL) - An AOL, issued by Douglas, or telex transmits information to operators on a specific model of aircraft. The AOL may serve as advance communication of a forthcoming Service Bulletin, an incident advisory, or a recommendation for an inspection or similar activity that does not involve hardware rework on the aircraft. It is approved by Douglas Engineering for technical accuracy. (20:5)

Contractor Logistics Support (CLS) - A pre-planned method used to provide all or part of the logistics support to a system, subsystem, modification, or equipment throughout its entire life cycle. CLS funding covers depot maintenance and, as negotiated with the operating command, necessary organizational and intermediate (O&I) level maintenance, software support, and other operation and maintenance (O&M) tasks. (9)

Configuration Control - The systematic evaluation, coordination, approval or disapproval, and implementation of all approved changes in the configuration of hardware/software or any of descrete portions, which satisfies an end use function of the weapon system. (11)

Database Management System (DBMS) - Computer programs that collect, store, retrieve, and report stored information in an organized way (34:8).

Decision Support System (DSS) - The term DSS generally applies to systems that are designed to help managers evaluate and analyze complex situations. (8:xv)

Engineering Change Proposal (ECP) - A term which includes both a proposed engineering change and the documentation by which the change is described and suggested. (12)

Expert System (ES) - An intelligent computer program that uses knowledge and inference procedures to solve problems that are difficult enough to require significant human expertise for their solution (16:5).

Heuristic Problem Solving - Results or decisions determined by "rules-of-thumb" or intuition instead of optimization and formal reasoning. (2:7)

Knowledge Engineer - The individual who performs the task of capturing an expert's knowledge in the rules and knowledge base of an expert system. (16:5)

MMAK - KC-10/C-9 System Program Management Office

MMAP - Production Management Office

MMAR - Technical Services Office

MMDDTF - Technical Data Office

OC-ALC - Oklahoma City Air Logistics Center

Principle Contracting Officer (PCO) - A government contracting officer who is appointed primarily to create and enter into new contracts. (1:Ch 4-page 17)

SARB - Service Action Review Board

Service Action (SA) - A generic term for contractor recommended proposed change to maintenance or component of the aircraft that is offered to the users to improve safety, reliability, and/or capability.

Service Bulletin (SB) - A Douglas SB, or a vendor service bulletin (VSB), is a formal announcement of a product change to the KC-10 that describes the requirements (parts, drawings, retrofit kits, etc.) and provides the instructions needed to accomplish the change. A delivered product change is a proposed or recommended change for one or more delivered configurations of products. The SB describes the responsibilities (Douglas or customer) for procuring the kits and parts and for accomplishing the change. All SBs are approved by the FAA. (20:5)

Service Letter (SL) - A KC-10 SL, issued by Douglas, transmits information to the Air Force of a design change which may have an impact on the customer's fleet or equipment. A KC-10 SL is used for changes that are of a minor nature (e.g., direct removal and replacement of a part), describes the requirements for parts, drawings, retrofit kits, and the like, and provides instructions. (20:5)

Task Change Proposal (TCP) - A formal priced document used to propose changes to the scope of work of the contract. It is differentiated from an ECP by the fact it does not affect specification or dawing requirements. (10)

Time Compliance Technical Order (TCTO) - A TCTO is the Air Force document that defines the requirement for incorporating a retrofit change or other action. (20:6)

Appendix B: Service Action Flow Outlines

NORMAL SERVICE ACTION PROCESS DEPOT

1. Service Action (and Engineering evaluation, if required) received/reviewed by MMAK, MMAR, and HQ SAC.

2. Service action scheduled for next monthly CCB.

3. CCB presentation -- approval/funding.

4. MMAK prepares/obtains coordination of AFSC Form 318.

5. MMAK provides minutes of CCB to DAC representative for transmittal to DAC, Long Beach.

6. DAC begins milestone tracking per CLS contract.

7. MMAK forwards completed AFSC Form 318 to MMAR for processing.

8. MMAR prepares AFLC Form 873 and Configuration Letter for TCTO. Forwards to MMDDTF.

9. MMDDTF assigns TCTO/Data Code numbers and returns to MMAR.

10. MMAR coordinates funds requirements with MMAK funds person.

11. MMAR forwards to MMAP
- AFLC Form 873
- AFSC Form 318
- Purchase Letter
- Copy of Service Action

12. MMAP forwards to PMWBB
- AFLC Form 873
- AFSC Form 318
- PR package--Kit & Installation PRs
- Copy of Service Action
- Form letter for TO preparation

13. PMWBB funds/authorizes (via contract P000) kit purchase.

14. PMWBB sends an authorization letter to DAC for TCTO & TO update preparation (TO update contract).

15. DAC orders kits.

16. Depot installation -- 90 days prior to scheduled initial kit delivery DAC is to provide hours required for installation to ACO under Over and Above line in CLS contract.

17. ACO reviews/approves hours.

18. 45-60 days prior to scheduled kit delivery DAC sends preliminary TCTO cover sheets to MMDDTF for review and approval.

19. MMDDTF reviews cover sheets and forwards copy to MMAR. MMDDTF returns any errors to DAC for correction or, if approved, sends TCTO cover sheet approval to DAC for TCTO cover sheet submittal - final cover sheets to be submitted 30 days prior to kit delivery.

20. DAC submits approved TCTO cover sheets and TO updates for printing.

21. DAC provides kit invoice to ACO for payment (invoice contains actual price of kit plus management fee).

22. ACO pays DAC.

23. DAC sends copy of DD 250 for kits to MMAP.

24. MMAP notifies MMAR of Kit arrival.

25. MMAR prepares AFLC Form 875.

26. MMAR forwards TCTO package through MMAP to MMDDTF.
AFLC Form 875

27. DAC sends TCTO cover sheets and TO updates to address provided in tO update contract for processing.

28. After processing TCTO cover sheets and TO updates will be sent to the GPO for printing and distribution.

29. GPO printer prints and distributes TCTOs and TO updates.

30. Depot incorporation -- DAC schedules incorporation.

31. DAC maintains CSAR/AF updates DO47.

---------- End ----------

COST KIT SERVICE ACTION PROCESS
NO COST INSTALL DEPOT

1. Service Action and Engineering evaluation received/reviewed by MMAK, MMAR, and HQ SAC.

2. Service action scheduled for next monthly CCB.

3. CCB presentation -- approval/funding.

4. MMAK prepares/obtains coordination of AFSC Form 318.

5. MMAK provides minutes of CCB to DAC representative for transmittal to DAC, Long Beach.

6. DAC begins milestone tracking per CLS contract.

7. MMAK forwards completed AFSC Form 318 to MMAP and MMAR for processing.

8. MMAR prepares AFLC Form 873 and Configuration Letter for TCTO. Forwards to MMDDTF.

9. MMDDTF assigns TCTO/Data Code numbers and returns to MMAR.

10. MMAR forwards to MMAP
- AFLC Form 873
- AFSC Form 318
- Purchase Letter
- Copy of Service Action
- AFLC Form 875

11. MMAR forwards to MMAK
- AFLC Form 873

12. MMAP forwards to PMWBB
- AFLC Form 873
- AFSC Form 318
- PR package--Kit & Installation PRs
- Copy of Service Action
- Form letter for TCTO/TO preparation

13. PMWBB funds/authorizes (via contract P000) kit purchase.

14. PMWBB sends an authorization letter to DAC for TCTO & TO update preparation (TO update contract).

15. DAC orders kits.

16. 45-60 days prior to scheduled kit delivery DAC sends preliminary TCTO cover sheets to MMDDTF for review and approval.

17. MMDDTF reviews cover sheets and forwards copy to MMAP and MMAR. MMDDTF returns any errors to DAC for correction or, if approved, sends TCTO cover sheet approval to DAC for TCTO cover sheet submittal - final cover sheets to be submitted 30 days prior to kit delivery.

18. DAC delivers approved TCTO cover sheets and TO updates for printing.

19. DAC notifies MMAP of kits delivery date.

20. MMAP signs AFLC Form 875 and returns it to MMAR.

21. DAC sends TCTO cover sheets and TO updates to address provided in tO update contract for processing.

22. After processing TCTO cover sheets and TO updates will be sent to the GPO for printing and distribution.

23. GPO printer prints and distributes TCTOs and TO updates.

24. Depot incorporation -- DAC schedules incorporation.

25. DAC maintains CSAR/AF updates D047.

---------- End ----------

NO COST KIT SERVICE ACTION PROCESS
COST INSTALL DEPOT

1. Service Action and Engineering evaluation received/reviewed by MMAK, MMAR, and HQ SAC.

2. Service action scheduled for next monthly CCB.

3. CCB presentation -- approval/funding.

4. MMAK prepares/obtains coordination of AFSC Form 318.

5. MMAK provides minutes of CCB to DAC representative for transmittal to DAC, Long Beach.

6. DAC begins milestone tracking per CLS contract.

7. MMAK forwards completed AFSC Form 318 to MMAP and MMAR for processing.

8. MMAR prepares AFLC Form 873 and Configuration Letter for TCTO. Forwards to MMDDTF.

9. MMDDTF assigns TCTO/Data Code numbers and returns to MMAR.

10. MMAR forwards to MMAP
- AFLC Form 873
- AFSC Form 318
- Purchase Letter
- Copy of Service Action
- AFLC Form 875

11. MMAR forwards to MMAK
- AFLC Form 873

12. MMAP forwards to PMWBB
- AFLC Form 873
- AFSC Form 318
- PR package--Kit & Installation PRs
- Copy of Service Action
- Form letter for TCTO/TO preparation

13. PMWBB funds/authorizes (via contract P000) kit procurement.

14. PMWBB sends an authorization letter to DAC for TCTO & TO update preparation (TO update contract).

15. DAC orders kits.

16. Depot installation -- 90 days prior to scheduled initial kit delivery DAC is to provide hours required for installation to ACO under Over and Above line in CLS contract.

17. ACO reviews/approves hours.

18. 45-60 days prior to scheduled kit delivery DAC sends preliminary TCTO cover sheets to MMDDTF for review and approval.

19. MMDDTF reviews cover sheets and forwards copy to MMAR. MMDDTF returns any errors to DAC for correction or, if approved, sends TCTO cover sheet approval to DAC for TCTO cover sheet submittal - final cover sheets to be submitted 30 days prior to kit delivery.

20. DAC delivers approved TCTO cover sheets and TO updates for printing.

21. DAC notifies MMAP of kits delivery date.

22. MMAP signs AFLC Form 875 and returns it to MMAR.

23. DAC sends TCTO cover sheets and TO updates to address provided in tO update contract for processing.

24. After processing TCTO cover sheets and TO updates will be sent to the GPO for printing and distribution.

25. GPO printer prints and distributes TCTOs and TO updates.

26. Depot incorporation -- DAC schedules incorporation.

27. DAC maintains CSAR/AF updates D047.

---------- End ----------

NO COST SERVICE ACTION PROCESS DEPOT

1. Service Action and Engineering evaluation received/reviewed by MMAK, MMAR, and HQ SAC.

2. Service action scheduled for next monthly CCB.

3. CCB presentation -- approval/funding.

4. MMAK prepares/obtains coordination of AFSC Form 318.

5. MMAK provides minutes of CCB to DAC representative for transmittal to DAC, Long Beach.

6. DAC begins milestone tracking per CLS contract.

7. MMAK forwards completed AFSC Form 318 to MMAP and MMAR for processing.

8. MMAR prepares AFLC Form 873 and Configuration Letter for TCTO. Forwards to MMDDTF.

9. MMDDTF assigns TCTO/Data Code numbers and returns to MMAR.

10. MMAR forwards to MMAK AFLC Form 873

11. MMAR forwards to MMAP AFLC Form 873

12. MMAP forwards to PMWBB AFLC Form 873
Form letter for TCTO/TO preparation

13. PMWBB funds/authorizes (via contract P000) kit procurement.

14. PMWBB sends an authorization letter to DAC for TCTO & TO update preparation (TO update contract).

15. DAC orders kits.

16. 45-60 days prior to scheduled kit delivery DAC sends preliminary TCTO cover sheets to MMDDTF for review and approval.

17. MMDDTF reviews cover sheets and forwards copy to MMAR. MMDDTF returns any errors to DAC for correction or, if approved, sends TCTO cover sheet approval to DAC for TCTO cover sheet submittal - final cover sheets to be submitted 30 days prior to kit delivery.

18. DAC delivers approved TCTO cover sheets and TO updates for printing.

19. DAC notifies MMAP of kits delivery date.

20. MMAP signs AFLC Form 875 and returns it to MMAR.

21. DAC sends TCTO cover sheets and TO updates to address provided in tO update contract for processing.

22. After processing TCTO cover sheets and TO updates will be sent to the GOP for printing and distribution.

23. GPO printer prints and distributes TCTOs and TO updates.

24. Depot incorporation -- DAC schedules incorporation.

25. DAC maintains CSAR/AF updates D047.

---------- End ----------

COST KIT	SERVICE ACTION PROCESS	ORG

1. Service Action and Engineering evaluation received/reviewed by MMAK, MMAR, and HQ SAC.
2. Service action scheduled for next monthly CCB.

3. CCB presentation -- approval/funding.

4. MMAK prepares/obtains coordination of AFSC Form 318.

5. MMAK provides minutes of CCB to DAC representative for transmittal to DAC, Long Beach.

6. DAC begins milestone tracking per CLS contract.

7. MMAK forwards completed AFSC Form 318 to MMAP and MMAR for processing.

8. MMAR prepares AFLC Form 873 and Configuration Letter for TCTO. Forwards to MMDDTF.

9. MMDDTF assigns TCTO/Data Code numbers and returns to MMAR.

10. MMAR forwards to MMAP
- AFLC Form 873
- AFSC Form 318
- Purchase Letter
- Copy of Service Action
- AFLC Form 875

11. MMAR forwards to MMAK
- AFLC Form 873

12. MMAP forwards to PMWBB
- AFLC Form 873
- AFSC Form 318
- PR package--Kit & Installation PRs
- Copy of Service Action
- Form letter for TCTO/TO preparation

13. PMWBB funds/authorizes (via contract P000) kit purchase.

14. PMWBB sends an authorization letter to DAC for TCTO & TO update preparation (TO update contract).

15. DAC orders kits.

16. 45-60 days prior to scheduled kit delivery DAC sends preliminary TCTO cover sheets to MMDDTF for review and approval.

17. MMDDTF reviews cover sheets and forwards copy to MMAP and MMAR. MMDDTF returns any errors to DAC for correction or, if approved, sends TCTO cover sheet approval to DAC for TCTO cover sheet submittal - final cover sheets to be submitted 30 days prior to kit delivery.

18. DAC delivers approved TCTO cover sheets and TO updates for printing.

19. DAC provides kit invoice to ACO for payment (invoice contains actual price of kit plus management fee).
20. ACO pays DAC.

21. DAC notifies MMAP of kit delivery date.

22. MMAP signs AFLC Form 875 and returns it to MMAR.

23. DAC sends TCTO cover sheets and TO updates to address provided in tO update contract for processing.

24. After processing TCTO cover sheets and TO updates will be sent to the GPO for printing and distribution.

25. GPO printer prints and distributes TCTOs and TO updates.

26. O level incorporation -- Upon TCTO receipt modification starts.

27. DAC maintains CSAR/AF updates D047.

---------- End ----------

NO COST KIT SERVICE ACTION PROCESS ORG

1. Service Action and Engineering evaluation received/reviewed by MMAK, MMAR, and HQ SAC.

2. Service action scheduled for next monthly CCB.

3. CCB presentation -- approval/funding.

4. MMAK prepares/obtains coordination of AFSC Form 318.

5. MMAK provides minutes of CCB to DAC representative for transmittal to DAC, Long Beach.

6. DAC begins milestone tracking per CLS contract.

7. MMAK forwards completed AFSC Form 318 to MMAP and MMAR for processing.

8. MMAR prepares AFLC Form 873 and Configuration Letter for TCTO. Forwards to MMDDTF.

9. MMDDTF assigns TCTO/Data Code numbers and returns to MMAR.

10. MMAR forwards to MMAP
- AFLC Form 873
- AFSC Form 318
- Purchase Letter
- Copy of Service Action
- AFLC Form 875

11. MMAR forwards to MMAK
- AFLC Form 873

12. MMAP forwards to PMWBB
- AFLC Form 873
- AFSC Form 318
- PR package--Kit & Installation PRs
- Copy of Service Action
- Form letter for TCTO/TO preparation

13. PMWBB authorizes (via contract P000) kit procurement.

14. PMWBB sends an authorization letter to DAC for TCTO & TO update preparation (TO update contract).

15. DAC orders kits.

16. 45-60 days prior to scheduled kit delivery DAC sends preliminary TCTO cover sheets to MMDDTF for review and approval.

17. MMDDTF reviews cover sheets and forwards copy to MMAP and MMAR. MMDDTF returns any errors to DAC for correction or, if approved, sends TCTO cover sheet approval to DAC for TCTO cover sheet submittal - final cover sheets to be submitted 30 days prior to kit delivery.

18. DAC delivers approved TCTO cover sheets and TO updates for printing.

19. DAC notifies MMAP of kit delivery date.

20. MMAP signs AFLC Form 875 and returns it to MMAR.

21. DAC sends TCTO cover sheets and TO updates to address provided in tO update contract for processing.

22. After processing TCTO cover sheets and TO updates will be sent to the GPO for printing and distribution.

23. GPO printer prints and distributes TCTOs and TO updates.

24. O level incorporation -- Upon TCTO receipt modification starts.

25. DAC maintains CSAR/AF updates D047.

---------- End ----------

Appendix C:

KC-10 EXPERT-DECISION SUPPORT-DATABASE SYSTEM

(KC-10 ES-DSS-DB)

USERS GUIDE

Developed by: Josephine L. Scarlett, B.S.

Captain, USAF

June 1990

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KC-10 ES-DSS-DB SYSTEM

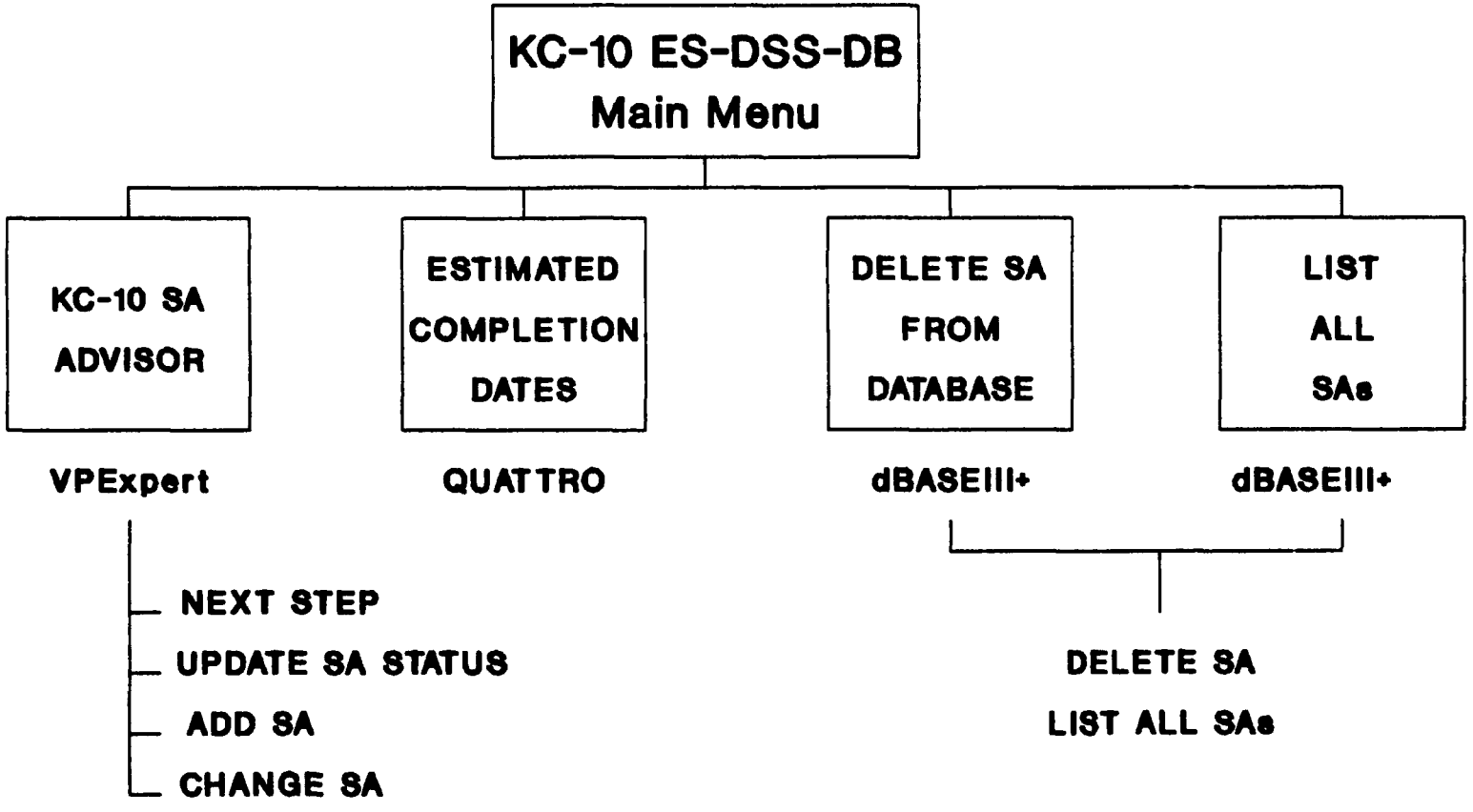

Figure 5. KC-10 ES-DSS-DB System

KC-10 SERVICE ACTION ES-DSS-DB USER GUIDE

Introduction

The KC-10 ES-DSS-DB system was developed to help logisticians manage KC-10 service actions (SAs). There are several parts to the system and detailed descriptions and capabilities of these different parts are contained within the user guide.

Loading System

In order to use the automated KC-10 ES-DSS-DB system; dBaseIII+, Quattro, VPExpert and the developed system files must be loaded onto the hard drive of a computer. To preclude unwanted interaction between this system and other systems on the computer, three separate directories need to be created. In the following procedure the user will create the directories off the root directory of his/her computer and copy files into those directories.

1. From the start-up screen, exit to DOS.
2. Type **CD C:** and press ENTER to go to the root directory.
3. Type **MD DB3** and press ENTER to create a new directory called DB3.
4. Move into the new directory by typing **CD DB3** and pressing ENTER.

5. Insert one of the dBaseIII+ disks in Drive A, type **COPY A:*.*** and press ENTER.

6. Replace the disk in Drive A with the other dBaseIII+ disk, type **COPY A:*.*** and press ENTER.

7. Repeat the instructions in step 6 with the third dBASEIII+ disk.

8. Type **CD C:** to move back to the root directory.

9. Type **MD QUATTRO** and press ENTER to create a new directory called QUATTRO.

10. Move into the new directory by typing **CD QUATTRO** and pressing ENTER.

11. Insert one of the QUATTRO disks in Drive A and type **COPY A:*.*** and press ENTER.

12. Replace the disk in Drive A with another QUATTRO disk and type **COPY A:*.*** and press ENTER.

13. Repeat the instructions in step 8 with the third QUATTRO disk.

14. Type **CD C:** to move back to the root directory.

15. Type **MD KC10SA** and press ENTER to create a new directory called KC10SA.

16. Move into the new directory by typing **CD KC10SA** and pressing ENTER.

17. Insert one of the KC10SA disks in Drive A, type **COPY A:*.*** and press ENTER.

18. Replace the disk in Drive A with the other KC10SA disk, type **COPY A:*.*** and press ENTER.

19. While still in the KC10SA directory, type **go**.

Typing **go** brings up the KC-10 ES-DSS-DB system's main menu which allows the user to operate different parts of the system. To make a selection, the user types the number beside the

corresponding part of the system that he/she wants to use and presses the ENTER key. Once the user has exited the system, he/she can bring up the starting 'main menu' by first, making sure he/she is still in the KC10SA directory, then, again typing **go**. The KC-10 ES-DSS-DB system only starts while the user is in the KC10SA directory. So, if the user has changed directories, type **CD\KC10SA** and press ENTER before typing **go**.

Logging On The System

After turning the computer on, in the KC-10 System Program Management Office, the computer displays the Material Management menu. The user needs to press the F10 key to exit to the root directory. From the root directory, the user types **CD\KC10SA**, presses the ENTER key, types **go**, and again presses the ENTER key. These keystrokes brings the KC-10 ES-DSS-DB system menu to the screen. The KC-10 ES-DSS-DB system menu displays five options:

KC-10 EXPERT-DECISION SUPPORT-DATABASE SYSTEM
(KC-10 ES-DSS-DB)

Main Menu

1. KC-10 Service Action Advisor (VPExpert)
2. Estimated Completion Dates For SA Dates (QUATTRO)
3. Delete a SA Record From The Database (dBASEIII+)
4. List All KC-10 SAs (dBASEIII+)
5. Exit The System

KC-10 Service Action Advisor (VPExpert)

This part of the KC-10 ES-DSS-DB system guides the user through the different steps of the different SA flows and allows

additions and modifications to the KC-10 SA database. Once the user has selected the KC-10 Service Action Advisor from the KC-10 ES-DSS-DB main menu, a separate KC-10 Service Action Advisor menu appears. From this menu, the user may select from five separate options what he/she may want to perform.

```
          WELCOME TO THE KC-10 SERVICE ACTION ADVISOR

     Please choose one of the options listed below:
-------------------------------------------------------
[1] Display Status & Determine Next Step in SA Process
[2] Update the Status of a Service Action
[3] Add a Service Action to the Database
[4] Change Information in the Service Action Database
[5] Exit This Menu & Return to KC-10 ES-DSS-DB Menu

          ***** NOTE *****
   TO: Estimate Completion Dates for SA Steps,
       Delete a SA Record From the Database,
       or. List All KC-10 SAs
   Exit this menu and make selection with Main Menu.
```

[1] Determine Step in Service Action Process. Option 1 displays the last recorded status of a SA and guides the user through six different SA processes. The system asks the user which Program Manager's SAs he/she wants to investigate, then it extracts the SAs from the database that have been recorded as belong to that Program Manager. From the SA list, the user is asked which particular SA he/she wants the system to retrieve. After the user identifies the SA to the system, it extracts the last recorded status of that SA and displays it to the user. At this point, the system asks the user if he/she wants to know the next step in the SA process. If the user answers "No", the

system goes back to the KC-10 Service Action Advisor menu. If the user answers "Yes", the system asks a series of basic questions about the SA to determine which SA flow to guide the user through based on whether or not the SA will be accomplished at Depot or Base level, whether or not there are kit costs associated with the SA, and in the case of Depot level, whether or not there are installation costs associated with the SA. The system guides the user through the SA steps by asking if he/she has completed each step in the SA process. If the step has been accomplished, the user will answer the question by positioning the curser over "Yes" and pressing the ENTER key. Whenever the user responds with a "Yes", the system automatically asks about the next step in the process. Anytime the user answers the question with a "No" or "Not Sure", the system tells him/her what action should be taken to ensure efficient SA processing. Once the user has either completed all the steps in the SA process or has answered a question with a "No" or "Not Sure", the system gives the user the option of changing the status recorded in the database or going back to the KC-10 Service Action Advisor menu. This option is a means to conveniently move to another option of the KC-10 Service Action Advisor without having to go back to the menu to make this choice. If the user chooses to take this option, the system transfers the Program Manager, SA number, and last recorded status information to the next option.

[2] Update the Status of a Service Action. This option allows the user to change the recorded status of any SA contained

in the database. The system asks the user which Program Manager's SA he/she wants to change, then, it extracts the SAs from the database which have been recorded as belonging to that Program Manager. Then, it asks which particular SA the user wants to change. The system tells the user the last recorded status and lists the different status descriptions. The user chooses which status description he/she wants to have stored in the database. After the choice has been made, the system shows the user what he/she chose as the status of that SA and returns the user to the KC-10 Service Action Advisor menu.

[3] Add a Service Action to the Database. This option gives the user a way to add SAs to the database. The system will ask the user to type the initials of the Program Manager who will have responsibility for the new SA. Next, it asks the type of service action that is being added. The user makes a selection from a list provided by the system. Next, the user will be required to type in the SA number of the new SA and tell the system the date it was received. Finally, the system provides a list of status descriptions and asks the user to choose which status description is applicable for the new SA. After the status has been provided the system displays to the user the information just entered then returns to the KC-10 Service Action Advisor menu.

[4] Change Information in the Service Action Database. This option gives the user a way to not only change the status of a SA, but also the SA type, number, receipt date, and responsible

Program Manager. The system first asks which Program Manager's SA he/she wants to change. Then, it extracts the SAs recorded as belonging to that Program Manager. The user is required to select the particular SA he/she wants to change. After the system knows exactly which SA is going to be changed, it asks the user if he/she wants to change the recorded Program Manager. If this answer is "Yes", the system asks the user to provide the new Program Manager's initials, displays the change, and asks if the user wants to change the SA type. If the user does not want to change the Program Manager, the system automatically asks whether or not he/she wants to change the recorded SA type. If "Yes", the user will need to select the correct SA type from a list the system provides. It then displays the change and asks if the user wants to change the SA number. If the user does not what to change the SA type, the system automatically asks if he/she wants to change the recorded SA number. If "Yes", the user is asked to provide the correct SA number. After the correct number has been typed in, the system displays the change, and asks if the user wants to change the SA status. If the user is not wanting to change the SA number, the system automatically asks if he/she wants to change the SA status. Again, if the answer is "Yes", the user is asked to select the correct status from a list of status descriptions provided by the system. After the user makes his/her selection the system displays the change, and asks if the user wants to change the SA receipt date. If the user does not want to change the SA status, the system asks the user if he/she

wants to change the SA receipt date. If "Yes", the user is required to type in the correct date. Then, the system displays the change and returns to the KC-10 Service Action Advisor menu. If the user answers this question with a "No" also, the system just returns to the KC-10 Service Action Advisor menu without making any changes to the database.

[5] Exit Menu. When the user chooses this option the system exits out of the KC-10 Service Action Advisor menu and takes the user to the KC-10 ES-DSS-DB main menu.

Solutions to ES Problems. At any time the user types the incorrect initials of a Program Manager, press the SLASH key, then, the letter Q. Next, again press the letter Q. This exits the user out of the program. To start the program over again position the curser block over the word CONSULT at the bottom of the screen, and press the ENTER key.

Estimated Completion Dates For SA Steps (QUATTRO)

This part of the KC-10 ES-DSS-DB system provides the user with a schedule of completion dates for the different SA steps as well as an estimated final completion date. It also allows the user to determine how delays in the schedule impacts future dates and the final completion date.

The first screen of the program tells the user what can be provided by using this part of the system and it gives some general instructions on how to operate the program. The user is given the opportunity to continue, by pressing the <Alt> key and

the letter "M", or to exit and return to the KC-10 ES-DSS-DB system, by pressing the <Alt> key and the letter "Q".

Service Action Process - Main Menu
****

A.	Normal Depot Level Service Action Process	<ALT-A>
B.	Depot Level No Install Cost Service Action Process	<ALT-B>
C.	No Cost Depot Level Service Action Process	<ALT-C>
D.	Depot Level No Kit Cost Service Action Process	<ALT-D>
E.	Normal Base Level Service Action Process	<ALT-E>
F.	No Cost Base Level Service Action Process	<ALT-F>

BE SURE TO USE THE ENTER KEY!

1. Enter Service Action (SA) Number here ---->
2. Enter date of SA receipt here (MM/DD/YY)-->
3. Press the <ALT> key and the letter above which corresponds to the type of SA ------>

If the user presses <Alt-M> to continue, the program displays the above screen and asks the user to enter the SA number and SA receipt date. Then, the user is required to select the appropriate SA process by pressing the <Alt> key and the letter corresponding to the appropriate SA process in a provided list.

Once the user has made his/her choice, the program displays a screen full of average estimated completion dates associated with that type of SA process. And, based on the date of SA receipt, the program tells the user the estimated completion dates for not only the different SA steps of the process, but also the final estimated completion date for that SA. If the user wants to see how a delay in one step of the process effects other steps, the user may change the average estimated dates. To

change the dates, the user moves up or down the screen with the arrow keys and changes the average number of days to complete a step by typing in as many days as he/she wants. The program will automatically change all the dates in the SA process as well as the final completion date. This screen also gives the user the option to print the displayed dates (<Alt-P>), return to the point where he/she can enter another SA number (<Alt-M>), or to exit the program and return to the KC-10 ES-DSS-DB menu (<Alt-Q>).

Delete a SA record from the Database (dBaseIII+)

This part of the KC-10 ES-DSS-DB system provides the user with a convenient way to delete unwanted SAs from the database. When the user selects option three from the KC-10 ES-DSS-DB menu, the system displays a separate dBaseIII+ menu with three options. The first option of this new menu runs the SA delete program, the second lists all the SAs stored in the database, and the third exits the user to the dBASEIII+ "dot" prompt.

KC-10 dBASE PROGRAMS

1. Delete SA's From SA Database
2. List All KC-10 Service Actions
3. Exit

Enter Choice __

The first option, the SA delete program, begins with checking with the user to make sure he/she wants to delete a SA from the database. The user has the choice to continue with the delete

program or to exit the program. If the user chooses the exit option the system displays the dBaseIII+ "dot" prompt. At this point, the user must type **quit** to go back to the KC-10 ES-DSS-DB system menu. If the user chooses to continue with the delete program, the system lists the record number, Program Manager, SA type, SA number, and SA status of all the SAs in the database, twenty records at a time. When the system reaches the end of the database file, it prompts the user to enter the record number of the SA he/she wants to delete. After the user types in the appropriate number, the screen clears, displays the record corresponding to the number he/she entered and asks if this record is the correct one to delete. If the user enters "N", the system exits to the dBaseIII+ "dot" prompt. At this point, the user must type **quit** to go back to the KC-10 ES-DSS-DB system menu. However, if the user wants to run the delete program again, he/she may type **do menu**, to bring the dBaseIII+ menu to the screen or type **do del_sa**, to perform the delete program again. If, after the system displays the record selected by the user, he/she does want to delete that record, the system performs the delete operation and brings to the screen the options to perform the delete operation again or to exit the system. Again at this point, if the user exits, he/she must type **quit** to go back to the KC-10 ES-DSS-DB system menu, **do menu**, to bring the dBaseIII+ menu to the screen, or **do del_sa**, to perform the delete program again.

List All KC-10 SAs (dBASEIII+)

This part of the KC-10 ES-DSS-DB system provides the user with a list of all the SAs stored in the database. When the user selects this option from the KC-10 ES-DSS-DB menu, the system displays a separate dBaseIII+ menu with three options. The first option of this new menu runs a SA delete program, the second option lists all the SAs, and the third option exits the user to the dBASEIII+ "dot" prompt.

KC-10 dBASE PROGRAMS

1. Delete SA's From SA Database
2. List All KC-10 Service Actions
3. Exit

Enter Choice __

If the user selects the second option, the system automatically displays a titled list of the Program Manager, SA type, SA number, and SA status of the SAs stored in the database. When the system reaches the end of the database file, it asks the user if he/she wants a printed copy. If "yes", the system prints the list and returns the user to the dBASEIII+ "dot" prompt. Once again, if the user wants to go back to the KC-10 ES-DSS-DB system menu, he/she must type **quit**. Or, the user may type **do menu**, to bring the dBaseIII+ menu to the screen, or **do salist**, to again display all the SAs.

Exit the System

When the user chooses this option from the KC-10 ES-DSS-DB system menu, the system exits to the KC10SA directory. At this

point, the user may bring back the KC-10 ES-DSS-DB system menu by typing **go** and pressing the ENTER key, or change to another directory on his/her computer by typing **CD** _____.

Appendix D: KC-10 ES-DSS-DB Programming

KC-10 EXPERT-DECISION SUPPORT-DATABASE SYSTEM
(KC-10 ES-DSS-DB)

Main Menu

1. KC-10 Service Action Advisor (VPExpert)
2. Estimated Completion Dates For SA Steps (QUATTRO)
3. Delete a SA Record From The Database (dBASEIII+)
4. List All KC-10 SAs (dBASEIII+)
5. Exit The System

^Z

```
echo off
cls
type menu.txt
prompt Select your choice and press ENTER:
^Z


ECHO OFF
CLS
SET OLDPATH=%PATH%
SET PATH=C:\KC10SA
CLS
TYPE WAIT.TXT
VPX C:\KC10SA\SA.KBS
PATH=%OLDPATH%
SET OLDPATH=
GO


echo off
cls
type wait.txt
c:\quattro\q
go


echo off
cls
set oldpath=%path%
set path=C:\DB3
cls
type wait.txt
dbase
path=%oldpath%
set oldpath=
go


echo off
cls
set oldpath=%path%
set path=C:\DB3
cls
type wait.txt
dbase
path=%oldpath%
set oldpath=
go
```

```
echo off
cls
set oldpath=%path%
set path=C:\DB3
cls
type wait.txt
dbase
path=%oldpath%
set oldpath=
go
```

```
ECHO OFF
CLS
CD\KC10SA
PROMPT $P$G
```

```
     Please standby, loading program....
```

```
!Developed By: Capt Jodi Scarlett                    June 90
!Filename SA.KBS
!
!Purpose:  This program helps KC-10 Logisticians manage their
!  Service Actions (SA).  It can display the current recorded
!  status of SAs, help Logisticians determine the next step in
!  the SA process, and allow Logisticians to update the database.
!
!Methodology:  The program begins by asking the user which option
!  they want to perform.  If the user wants to check the current
!  recorded status then the program asks whose SAs they want to
!  investigate.  It will allow the user to select as many Program
!  Managers as they want to, then it checks the database and
!  selects all the SAs recorded as belong to the selected Program
!  Manager(s).  After the user selects which SA they want to
!  investigate the program displays the current recorded status.
!  The user can then either quit or examine the SA process to
!  determine what their next step should be in updating the SA
!  status.  The program asks the user some basic questions
!  concerning the SA, then it chains to the appropriate SA process
!  based on the user's answers.  After the user answers the
!  questions about the SA process the program gives the user advice
!  as to what should be their next step.  It also asks the user if
!  they want to update the status recorded in the database.
!
!Modules:  The system uses several modules, SA.KBS is the menu
!  module; KC10SA.KBS is the main SA Process module - which
!  determines which SA Process to lead the logistician through;
!  SAFLOW.KBS, SAFLOWB.KBS, SAFLOWC.KBS, SAFLOWD.KBS, BSAFLOW.KBS,
!  and BSAFLOWB.KBS are the different SA flow processes; and
!  CHANGE.KBS allows the user to make updates to the database.

EXECUTE;
ENDOFF;
RUNTIME;
BKCOLOR = 7;

!Actions Block
ACTIONS
     COLOR=0
     LOADFACTS C:\KC10SA\FACTFILE
          DISPLAY
"               WELCOME TO THE KC-10 SERVICE ACTION ADVISOR!"

     WOPEN 1,3,9,17,57,7
     ACTIVE 1
```

```
          DISPLAY
" Please choose one of the options listed below:
-----------------------------------------------------
[1] Display Status & Determine Next Step in SA Process
[2] Update the Status of a Service Action
[3] Add a Service Action to the Database
[4] Change Information in the Service Action Database
[5] Exit This Menu & Return to KC-10 ES-DSS-DB Menu

               **** NOTE ****
  TO: Estimate Completion Dates for SA Steps,
      Delete a SA Record from the Database, or
      List all KC-10 SAs,
  Exit this menu and make selection with Main Menu."

     GETCH Task
     WCLOSE 1

WHILETRUE Task = 1
     THEN CHAIN C:\KC10SA\KC10SA
END

WHILETRUE Task = 2
     THEN RESET ALL
     SAVEFACTS C:\KC10SA\FACTFILE
     CHAIN C:\KC10SA\ChangeSA
END

WHILETRUE Task = 3
     THEN RESET ALL
     SAVEFACTS C:\KC10SA\FACTFILE
     CHAIN C:\KC10SA\Add_SA
END

WHILETRUE Task = 4
     THEN RESET ALL
     SAVEFACTS C:\KC10SA\FACTFILE
     CHAIN C:\KC10SA\CORRECT
END
;

^Z
```

```
! Filename: KC10SA.KBS

!!!!! ACTIONS BLOCK
EXECUTE;
ENDOFF;
RUNTIME;
BKCOLOR=7;

ACTIONS
   COLOR=0
   WOPEN 1,5,9,12,60,7
   ACTIVE 1
   DISPLAY "

       This part of the KC-10 Service Action Advisor
      guides you through the steps in the SA process.

"
   FIND Check
   WCLOSE 1
   CLS

WHILETRUE Check=Continue THEN
   CLS
   FIND SAMgr
   RESET Check
END

WHILETRUE Check=Main_Menu THEN
   RESET Continue
   CLS
   CHAIN C:\KC10SA\SA
END

  WHILEKNOWN Switch
     RESET SA_Num
     MENU SA_Num,SAMgr=PROGMGR,C:\KC10SA\KC10,SANumber
     cls
     FIND SA_Num
     MRESET SA_Num
       GET SA_Num=SANUMBER,C:\KC10SA\KC10,Status
       CLS
       DISPLAY "The last recorded status for {SA_Num} is {Status}.


"
       FIND Continue
       CLOSE C:\KC10SA\KC10
     RESET Switch
     CLS
   END
```

```
WHILETRUE Continue=Yes THEN
   FIND Advice
   RESET Continue
   CLS
END

WHILETRUE Continue=No THEN
   RESET Continue
   CLS
   CHAIN C:\KC10SA\SA
END;


!!!!! RULES BLOCK

RULE 0
IF         Level=Depot_Level AND
           Kit=Yes AND
           Install=Yes
THEN       Advice=Normal_Depot_Process
           SAVEFACTS C:\KC10SA\FACTFILE
           CHAIN C:\KC10SA\SAFlow;

RULE 1
IF         Level=Depot_Level AND
           Kit=No AND
           Install=No
THEN       Advice=No_Cost_Depot_Process
           SAVEFACTS C:\KC10SA\FACTFILE
           CHAIN C:\KC10SA\SAFlowC;

RULE 2
IF         Level=Depot_Level AND
           Kit=No AND
           Install=Yes
THEN       Advice=No_Kit_Cost_Depot_Process
           SAVEFACTS C:\KC10SA\FACTFILE
           CHAIN C:\KC10SA\SAFlowD;

RULE 3
IF         Level=Depot_Level AND
           Kit=Yes  AND
           Install=No
THEN       Advice=No_Install_Cost_Depot_Process
           SAVEFACTS C:\KC10SA\FACTFILE
           CHAIN C:\KC10SA\SAFlowB;
```

```
RULE 4
IF          Level=Base_Level AND
            Kit=Yes
THEN        Advice=Normal_Base_Process
            SAVEFACTS C:\KC10SA\FACTFILE
            CHAIN C:\KC10SA\BSAFlow;

RULE 5
IF          Level=Base_Level AND
            Kit=No
THEN        Advice=No_Kit_Cost_Base_Process
            SAVEFACTS C:\KC10SA\FACTFILE
            CHAIN C:\KC10SA\BSAFlowB;

!!!!! ASK STATEMENT BLOCK

ASK CHECK:"   Do you want to Continue or go back to the Main Menu?
";
CHOICES CHECK:          Continue, Main_Menu;

ASK SAMGR: "  Type the initials of the Program Manager responsible
for   the SA you are interested in....  Then, press ENTER.

  **NOTE** Data is stored by the Program Manager's initials.

EXAMPLES:JF,AML,PR,MH,GH,AM,CB,SH,BF,ADL,TM,LS,TT,KW,RC,RW,JB,CJF
";

ASK SA_Num: "Which SA are you interested in?

Move the curser block with the arrow keys then press ENTER.
";

ASK Continue: "Do you want to know the next step in the SA process?
";
CHOICES Continue: Yes,No;


!!!!! ASK STATEMENTS FOR RULES BLOCK

ASK Level: "What level will this SA be accomplished?";
CHOICES Level: Depot_Level,Base_Level;

ASK Kit: "Are there Kit costs involved with this SA?";
CHOICES Kit: Yes,No;

ASK Install: "Are there Installation costs involved with this SA?";
CHOICES Install: Yes,No;

^Z
```

```
!********** Normal Depot Level SA Process **********
! Filename SAFLOW.KBS

EXECUTE;
ENDOFF;
RUNTIME;
BKCOLOR=7;

!!!!! Actions Block
ACTIONS
     LOADFACTS C:\KC10SA\FACTFILE
     COLOR=0
     WOPEN 1,5,9,8,60,7
     ACTIVE 1
     DISPLAY "
       This part of the KC-10 SA Advisor guides you
        through the NORMAL DEPOT LEVEL SA process.


   Press any key to begin the consultation..."
     WCLOSE 1
     CLS
     FIND Next
     CLS
    RESET Continue
     FIND Continue

  WHILETRUE Continue=Yes THEN
    RESET Continue
    SAVEFACTS C:\KC10SA\FACTFILE
    CHAIN C:\KC10SA\ChangeSA
  END

  WHILETRUE Continue=No THEN
    RESET Continue
    SAVEFACTS C:\KC10SA\FACTFILE
    CHAIN C:\KC10SA\SA
  END
;
```

```
!!!!! Rules Statements
RULE 1
IF        SA=No AND
          ENG_EVAL=Yes
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative.  You should
          receive the SA document at the same time
          as MMAR.  SARB requires both documents.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
RULE 2
IF        SA=Yes AND
          ENG_EVAL=No
THEN      Next=Wait_for_Eng_Eval_from_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Wait for an Engneering Evaluation from
          MMAR.  SARB requires both documents.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
RULE 3
IF        SA=No AND
          ENG_EVAL=No
THEN      Next=Wait_for_SA_or_Eng_Eval_arrival
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Wait for a SA from DAC or an Engneering
          Evaluation from MMAR.  SA processing
          requires a SA!

       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 4
IF        CCB=No
THEN      Next=Schedule_SA_for_CCB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Schedule the SA for SARB.

       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 5
IF        RESULT=Disapproved
THEN      Next=Place_SA_in_Closed_SA_files
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Place the SA in the Closed SA files.
          No further action is required for this SA.


       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 6
IF        Form_318=No
THEN      Next=Complete_AFSC_Form_318
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Complete the AFSC 318 Form and send a copy
          to MMAR.  This officially notifies MMAR of
          the SARB decision.

       Press any key to continue..."
          WCLOSE 2
          CLS;
```

```
RULE 7
IF        Forward=No
THEN      Next=Send_copy_of_318_to_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          After completing the AFSC 318 Form, send a copy
          to MMAR.  This officially notifies MMAR of
          the SARB decision so they can prepare/process
          the 873 form.

       Press any key to continue...~
"
          WCLOSE 2
          CLS;
RULE 8
IF        Forward=Not_Sure
THEN      Next=Check_with_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Check with MMAR to see if they received a
          copy of the 318 Form.  This officially
          notifies MMAR of the SARB decision and they
          require the 318 Form before they can prepare/
          process the 873 Form.

       Press any key to continue...~ "
          WCLOSE 2
          CLS;
RULE 9
IF        Minutes=No
THEN      Next=Give_CCB_minutes_to_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Send a copy of the SARB Minutes to DAC.
          This officially notifies DAC of the SARB
          decision.

       Press any key to continue...~ "
          WCLOSE 2
          CLS;
```

```
RULE 10
IF        Minutes=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Check with the DAC representative.  DAC
          requires official notification of the SARB
          decision.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
RULE 11
IF        Funds=No
THEN      Next=Give_Cost_Est_to_Funds_Mgr
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Give the cost estimate of your SA to the
          MMAK Funds Manager.  SA estimates are required
          to compute KC-10 budget estimates.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 12
IF        Form_873_to_MMDDTF=No OR Form_873_to_MMDDTF=Not_Sure
THEN      Next=Check_with_MMAR_and_MMDDTF
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR & MMDDTF to check the status
          of your SA.  MMDDTF needs to assign a TCTO
          number to your SA & return the 873 Form to
          MMAR before MMAR can send the 873 Form to
          MMAP.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 13
IF        MMAR_FORM_873=NO OR MMAR_FORM_873=NOT_SURE
THEN      Next=Check_with_MMAR_&_MMDDTF
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTF & MMAR to check the status
          of your SA.  MMDDTF needs to assign a TCTO
          number to your SA & return the 873 Form to
          MMAR before MMAR can send the 873 Form to MMAP.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
RULE 14
IF        Form_873=No
THEN      Next=Check_with_MMAR_and_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR to check the status of your
          SA.  MMAR needs to send the 873 Form to MMAP
          before they can complete the PR package.


       Press any key to continue..." "
          WCLOSE 2
          CLS;
RULE 15
IF        Form_873=Not_Sure
THEN      Next=Check_with_MMAR_and_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR & MMAP to check the status of
          your SA.  MMAR needs to send the 873 Form
          to MMAP before they can complete the PR
          package.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 16
IF        PR=No
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP to check the status of your
          SA.  MMAP needs to complete the PR and send
          it to PMWBB.

       Press any key to continue..."
"
          WCLOSE 2
          CLS,

RULE 17
IF        PR=Not_Sure
THEN      Next=Check_with_MMAP_&_PMWBB
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP & PMWBB to check the status
          of your SA.  MMAP needs to complete the PR
          and send it to PMWBB.

        Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 18
IF        PMWBB=No OR PMWBB=Not_Sure
THEN      Next=Check_with_PMWBB
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact PMWBB to check the status of your
          SA.


       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 20
IF        KITS=No or KITS=Not_Sure
THEN      Next=Inform_PMWBB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact PMWBB or DAC Representative to find
          out status of SA, because there may be
          contractual problems.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 20b
IF        O&A=No or O&A=Not_Sure
THEN      Next=Inform_PMWBB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact ACO or DAC to find out status of SA,
          because there may be problems.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 22
IF        ACO=No or ACO=Not_Sure
THEN      Next=Inform_PMWBB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact ACO & DAC Representative
          to find out status of SA, because there
          may be problems.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
```

```
RULE 23
IF        TCTO=No or TCTO=Not_Sure
THEN      Next=Inform_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMDDTF to
          find out status of SA, because the TCTO
          coversheet has to be approved & printed
          before it can be incorporated on the
          aircraft.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
RULE 24
IF        Delivery_Date=No
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative to check the
          status of your SA, because MMAP has to be
          notified of Kit delivery before they can
          send a signed 875 Form to MMAR.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
RULE 25
IF        Delivery_Date=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMAP to
          find out status of SA, because the MMAP
          has to be notified of Kit delivery before
          they can send a signed 875 Form to MMAR
          & MMDDTF.
       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 26
IF        Schedule=No
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative to find out the
          status of your SA.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 27
IF        Schedule=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMAP to find
          out status of SA.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 28
IF        MMAP=Not_Sure
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
        Your next step in the SA process is to:

        Contact MMAR & MMAP to find out status
        of SA, because MMAP has to send a signed
        875 Form to MMAR before TCTO incorporation.

     Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 29
IF        MMAP=No
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP to find out status of your
          SA, MMAP has to send a signed 875 Form
          to MMAR before TCTO incorporation.

       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 30
IF        TCTO_Approved=No or TCTO_Approved=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTF to find out status of SA,
          because the TCTO coversheet has to be
          approved & printed before it can be
          incorporated on the aircraft.

       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 34
IF        Field_Receipt=No or Field_Receipt=Not_Sure
THEN      Next=Check_with_MMDDTF_&_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTPD to find out status of SA,
          because there may be problems.

       Press any key to continue..."
          WCLOSE 2
          CLS;
```

```
RULE 35
IF        Field_Receipt=Yes
THEN      Next=History
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Continue to track SA incorporation with
          the DAC CSAR system & DO47.

       Press any key to continue..."
          WCLOSE 2
          CLS;

!!!!! Ask Statements
ASK SA: "Have you received a SA?";
CHOICES SA: Yes, No;

ASK ENG_EVAL: "Do you have an Engineering Evaluation on this SA?";
CHOICES ENG_EVAL: Yes, No;

ASK CCB: "Has the SA been presented at SARB?";
CHOICES CCB: Yes, No;

ASK RESULT: "What was the SARB decision?";
CHOICES RESULT: Approved, Disapproved;

ASK FORM_318: "Have you completed an AFSC Form 318?";
CHOICES FORM_318: Yes, No;

ASK FORWARD: "Have you sent a copy of the 318 Form to MMAR?";
CHOICES FORWARD: Yes, No, Not_Sure;

ASK MINUTES: "Has a copy of the SARB Minutes been sent to DAC?";
CHOICES MINUTES: Yes, No, Not_Sure;

ASK FUNDS: "Have you told the Funds Mgr of the estimated costs of
your SA?";
CHOICES FUNDS: Yes, No;

ASK FORM_873_TO_MMDDTF: "Has MMAR sent the 873 Form to MMDDTF?";
CHOICES FORM_873_TO_MMDDTF: Yes, No, Not_Sure;

ASK MMAR_FORM_873: "Has MMDDTF assigned the TCTO number & returned
the 873 Form to MMAR?";
CHOICES MMAR_FORM_873: Yes, No, Not_Sure;
```

```
ASK FORM_873: "Has MMAP received the AFLC 873 Form & Procurement
Request Letter from MMAR?";
CHOICES FORM_873: Yes, No, Not_Sure;

ASK PR: "Has MMAP processed the PR through to PMWBB?";
CHOICES PR: Yes, No, Not_Sure;

ASK PMWBB: "Has PMWBB authorized SA Kit Purchase?";
CHOICES PMWBB: Yes, No, Not_Sure;

ASK KITS: "Has DAC ordered the SA kits?";
CHOICES KITS: Yes, No, Not_Sure;

ASK O&A: "Has DAC provided the ACO Over & Above costs for
installation?";
CHOICES O&A: Yes, No, Not_Sure;

ASK ACO: "Has ACO approved the installation hour requirements?";
CHOICES ACO: Yes, No, Not_Sure;

ASK TCTO: "Has MMDDTF received the preliminary TCTO cover sheets
from DAC?";
Choices TCTO: Yes, No, Not_Sure;

ASK Delivery_Date: "Has DAC notified MMAP of kit delivery?";
Choices Delivery_Date: Yes, No, Not_Sure;

ASK Schedule: "Has DAC informed MMAP of the incorporation
schedule?";
Choices Schedule: Yes, No, Not_Sure;

ASK MMAP: "Has MMAR & MMDDTF received tne signed AFLC Form 875 from
MMAP?";
Choices MMAP: Yes, No, Not_Sure;

ASK TCTO_Approved: "Has the TCTO cover sheets been approved?";
Choices TCTO_Approved: Yes, No, Not_Sure;

ASK Field_Receipt: "Has the TCTO/TO changes been printed &
distributed?";
Choices Field_Receipt: Yes, No, Not_Sure;

ASK Continue: "Do you want to update the SA status in the
database?";
Choices Continue: Yes, No;

^Z
```

```
!********** Depot Level No Install SA Process **********
! Filename SAFLOWB.KBS

EXECUTE;
ENDOFF;
RUNTIME;
BKCOLOR=7;

!!!!! Actions Block
ACTIONS
     LOADFACTS C:\KC10SA\FACTFILE
     COLOR=0
     WOPEN 1,5,9,8,60,7
     ACTIVE 1
     DISPLAY "
   This part of the KC-10 SA Advisor guides you through
     the DEPOT LEVEL NO INSTALLATION COST SA process.


   Press any key to begin the consultation...~"
     WCLOSE 1
     CLS
     FIND Next
     CLS
    RESET Continue
     FIND Continue

  WHILETRUE Continue=Yes THEN
    RESET Continue
    SAVEFACTS C:\KC10SA\FACTFILE
    CHAIN C:\KC10SA\ChangeSA
  END

  WHILETRUE Continue=No THEN
    RESET Continue
    SAVEFACTS C:\KC10SA\FACTFILE
    CHAIN C:\KC10SA\SA
  END
;
```

```
!!!!! Rules Statements
RULE 1
IF        SA=No AND
          ENG_EVAL=Yes
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative.  You should
          receive the SA document at the same time
          as MMAR.  SARB requires both documents.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 2
IF        SA=Yes AND
          ENG_EVAL=No
THEN      Next=Wait_for_Eng_Eval_from_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Wait for an Engneering Evaluation from
          MMAR.  SARB requires both documents.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
RULE 3
IF        SA=No AND
          ENG_EVAL=No
THEN      Next=Wait_for_SA_or_Eng_Eval_arrival
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Wait for a SA from DAC or an Engneering
          Evaluation from MMAR.  SA processing
          requires a SA!

       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 4
IF        CCB=No
THEN      Next=Schedule_SA_for_CCB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Schedule the SA for SARB.

       Press any key to continue...~ "
          WCLOSE 2
          CLS;

RULE 5
IF        RESULT=Disapproved
THEN      Next=Place_SA_in_Closed_SA_files
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Place the SA in the Closed SA files.
          No further action is required for this SA.


       Press any key to continue...~ "
          WCLOSE 2
          CLS;

RULE 6
IF        Form_318=No
THEN      Next=Complete_AFSC_Form_318
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Complete the AFSC 318 Form and send a copy
          to MMAR.  This officially notifies MMAR of
          the SARB decision.

       Press any key to continue...~ "
          WCLOSE 2
          CLS;
```

```
RULE 7
IF        Forward=No
THEN      Next=Send_copy_of_318_to_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          After completing the AFSC 318 Form, send a copy
          to MMAR.  This officially notifies MMAR of
          the SARB decision so they can prepare/process
          the 873 form.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 8
IF        Forward=Not_Sure
THEN      Next=Check_with_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Check with MMAR to see if they received a
          copy of the 318 Form.  This officially
          notifies MMAR of the SARB decision and they
          require the 318 Form before they can prepare/
          process the 873 Form.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
RULE 9
IF        Minutes=No
THEN      Next=Give_CCB_minutes_to_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Send a copy of the SARB Minutes to DAC.
          This officially notifies DAC of the SARB
          decision.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 10
IF        Minutes=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Check with the DAC representative.  DAC
          requires official notification of the SARB
          decision.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 11
IF        Funds=No
THEN      Next=Give_Cost_Est_to_Funds_Mgr
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Give the cost estimate of your SA to the
          MMAK Funds Manager.  SA estimates are required
          to compute KC-10 budget estimates.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 12
IF        Form_873_to_MMDDTF=No OR Form_873_to_MMDDTF=Not_Sure
THEN      Next=Check_with_MMAR_and_MMDDTF
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR & MMDDTF to check the status
          of your SA.  MMDDTF needs to assign a TCTO
          number to your SA & return the 873 Form to
          MMAR before MMAR can send the 873 Form to
          MMAP.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 13
IF        MMAR_FORM_873=NO OR MMAR_FORM_873=NOT_SURE
THEN      Next=Check_with_MMAR_&_MMDDTF
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTF & MMAR to check the status
          of your SA.  MMDDTF needs to assign a TCTO
          number to your SA & return the 873 Form to
          MMAR before MMAR can send the 873 Form to
          MMAP.

       Press any key to continue...~ "
          WCLOSE 2
          CLS;
RULE 14
IF        Form_873=No
THEN      Next=Check_with_MMAR_and_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR to check the status of your
          SA.  MMAR needs to send the 873 Form to MMAP
          before they can complete the PR package.


       Press any key to continue...~ "
          WCLOSE 2
          CLS;
RULE 15
IF        Form_873=Not_Sure
THEN      Next=Check_with_MMAR_and_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR & MMAP to check the status of
          your SA.  MMAR needs to send the 873 Form
          to MMAP before they can complete the PR
          package.

       Press any key to continue...~ "
          WCLOSE 2
          CLS;
```

```
RULE 16
IF        PR=No
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP to check the status of your
          SA.  MMAP needs to complete the PR and send
          it to PMWBB.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 17
IF        PR=Not_Sure
THEN      Next=Check_with_MMAP_&_PMWBB
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP & PMWBB to check the status
          of your SA.  MMAP needs to complete the PR
          and send it to PMWBB.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 18
IF        PMWBB=No OR PMWBB=Not_Sure
THEN      Next=Check_with_PMWBB
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact PMWBB to check the status of your
          SA.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
```

```
RULE 20
IF       KITS=No or KITS=Not_Sure
THEN     Next=Inform_PMWBB
         CLS
         WOPEN 2,4,9,10,60,7
         ACTIVE 2
         DISPLAY "
         Your next step in the SA process is to:

         Contact PMWBB or DAC Representative to find
         out status of SA, because there may be
         contractual problems.

      Press any key to continue..."
"
         WCLOSE 2
         CLS;

RULE 21
IF       INSTALL2=No or INSTALL2=Not_Sure
THEN     Next=Inform_PMWBB
         CLS
         WOPEN 2,4,9,10,60,7
         ACTIVE 2
         DISPLAY "
         Your next step in the SA process is to:

         Contact ACO or DAC Representative to find
         out status of SA, because there may be
         kit delivery problems.

      Press any key to continue..."
"
         WCLOSE 2
         CLS;

RULE 22
IF       ACO=No or ACO=Not_Sure
THEN     Next=Inform_PMWBB
         CLS
         WOPEN 2,4,9,10,60,7
         ACTIVE 2
         DISPLAY "
         Your next step in the SA process is to:

         Contact ACO & DAC Representative
         to find out status of SA, because there
         may be problems.

      Press any key to continue..." "
         WCLOSE 2
         CLS;
```

```
RULE 23
IF        TCTO=No or TCTO=Not_Sure
THEN      Next=Inform_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMDDTF to
          find out status of SA, because the TCTO
          coversheet has to be approved & printed
          before it can be incorporated on the
          aircraft.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
RULE 24
IF        Delivery_Date=No
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative to check the
          status of your SA, because MMAP has to be
          notified of Kit delivery before they can
          send a signed 875 Form to MMAR.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 25
IF        Delivery_Date=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMAP to
          find out status of SA, because the MMAP
          has to be notified of Kit delivery before
          they can send a signed 875 Form to MMAR
          & MMDDTF.
       Press any key to continue..." "
         WCLOSE 2
          CLS;
```

```
RULE 26
IF        Schedule=No
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative to find out the
          status of your SA.

       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 27
IF        Schedule=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMAP to find
          out status of SA.

       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 28
IF        MMAP=Not_Sure
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
         Your next step in the SA process is to:

         Contact MMAR & MMAP to find out status
         of SA, because MMAP has to send a signed
         875 Form to MMAR before TCTO incorporation.

     Press any key to continue..."
          WCLOSE 2
          CLS;
```

```
RULE 29
IF        MMAP=No
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP to find out status of your
          SA, MMAP has to send a signed 875 Form
          to MMAR before TCTO incorporation.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 30
IF        TCTO_Approved=No or TCTO_Approved=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTF to find out status of SA,
          because the TCTO coversheet has to be
          approved & printed before it can be
          incorporated on the aircraft.

       Press any key to continue..."
"         WCLOSE 2
          CLS;


RULE 34
IF        Field_Receipt=No or Field_Receipt=Not_Sure
THEN      Next=Check_with_MMDDTF_&_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTPD to find out status of SA,
          because there may be problems.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 35
IF        Field_Receipt=Yes
THEN      Next=History
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Continue to track SA incorporation with
          the DAC CSAR system & D047.

       Press any key to continue..."
          WCLOSE 2
          CLS;

!!!!! Ask Statements
ASK SA: "Have you received a SA?";
CHOICES SA: Yes, No;

ASK ENG_EVAL: "Do you have an Engineering Evaluation on this SA?";
CHOICES ENG_EVAL: Yes, No;

ASK CCB: "Has the SA been presented at SARB?";
CHOICES CCB: Yes, No;

ASK RESULT: "What was the SARB decision?";
CHOICES RESULT: Approved, Disapproved;

ASK FORM_318: "Have you completed an AFSC Form 318?";
CHOICES FORM_318: Yes, No;

ASK FORWARD: "Have you sent a copy of the 318 Form to MMAR?";
CHOICES FORWARD: Yes, No, Not_Sure;

ASK MINUTES: "Has a copy of the SARB Minutes been sent to DAC?";
CHOICES MINUTES: Yes, No, Not_Sure;

ASK FUNDS: "Have you told the Funds Mgr of the estimated costs of
your SA?";
CHOICES FUNDS: Yes, No;

ASK FORM_873_TO_MMDDTF: "Has MMAR sent the 873 Form to MMDDTF?";
CHOICES FORM_873_TO_MMDDTF: Yes, No, Not_Sure;

ASK MMAR_FORM_873: "Has MMDDTF assigned the TCTO number & returned
the 873 Form to MMAR?";
CHOICES MMAR_FORM_873: Yes, No, Not_Sure;
```

```
ASK FORM_873: "Has MMAP received the AFLC 873 Form & Procurement
Request Letter from MMAR?";
CHOICES FORM_873: Yes, No, Not_Sure;

ASK PR: "Has MMAP processed the PR through to PMWBB?";
CHOICES PR: Yes, No, Not_Sure;

ASK PMWBB: "Has PMWBB authorized SA Kit Purchase?";
CHOICES PMWBB: Yes, No, Not_Sure;

ASK KITS: "Has DAC ordered the SA kits?";
CHOICES KITS: Yes, No, Not_Sure;

ASK INSTALL2: "Has DAC provided the ACO with installation hour
requirements?";
CHOICES INSTALL2: Yes, No, Not_Sure;

ASK ACO: "Has ACO approved the installation hour requirements?";
CHOICES ACO: Yes, No, Not_Sure;

ASK TCTO: "Has MMDDTF received the preliminary TCTO cover sheets
from DAC?";
Choices TCTO: Yes, No, Not_Sure;

ASK Delivery_Date: "Has DAC notified MMAP of kit delivery?";
Choices Delivery_Date: Yes, No, Not_Sure;

ASK Schedule: "Has DAC informed MMAP of the incorporation
schedule?";
Choices Schedule: Yes, No, Not_Sure;

ASK MMAP: "Has MMAR & MMDDTF received the signed AFLC Form 875 from
MMAP?";
Choices MMAP: Yes, No, Not_Sure;

ASK TCTO_Approved: "Has the TCTO cover sheets been approved?";
Choices TCTO_Approved: Yes, No, Not_Sure;

ASK Field_Receipt: "Has the TCTO/TO changes been printed &
distributed?";
Choices Field_Receipt: Yes, No, Not_Sure;

ASK Continue: "Do you want to update the SA status in the
database?";
Choices Continue: Yes, No;

^Z
```

```
!********** No Cost Depot Level SA Process **********
! Filename SAFLOWC.KBS

EXECUTE;
ENDOFF;
RUNTIME;
BKCOLOR=7;

!!!!! Actions Block
ACTIONS
     LOADFACTS C:\KC10SA\FACTFILE
     COLOR=0
     WOPEN 1,5,9,8,60,7
     ACTIVE 1
     DISPLAY "
      This part of the KC-10 SA Advisor guides you
       through the NO COST DEPOT LEVEL SA process.


   Press any key to begin the consultation..."
     WCLOSE 1
     CLS
     FIND Next
     CLS
    RESET Continue
     FIND Continue

  WHILETRUE Continue=Yes THEN
    RESET Continue
    SAVEFACTS C:\KC10SA\FACTFILE
    CHAIN C:\KC10SA\ChangeSA
  END

  WHILETRUE Continue=No THEN
    RESET Continue
    SAVEFACTS C:\KC10SA\FACTFILE
    CHAIN C:\KC10SA\SA
  END
;
```

```
!!!!! Rules Statements
RULE 1
IF        SA=No AND
          ENG_EVAL=Yes
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative.  You should
          receive the SA document at the same time
          as MMAR.  SARB requires both documents.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 2
IF        SA=Yes AND
          ENG_EVAL=No
THEN      Next=Wait_for_Eng_Eval_from_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Wait for an Engneering Evaluation from
          MMAR.  SARB requires both documents.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 3
IF        SA=No AND
          ENG_EVAL=No
THEN      Next=Wait_for_SA_or_Eng_Eval_arrival
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Wait for a SA from DAC or an Engneering
          Evaluation from MMAR.  SA processing
          requires a SA!

        Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 4
IF        CCB=No
THEN      Next=Schedule_SA_for_CCB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Schedule the SA for SARB.

       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 5
IF        RESULT=Disapproved
THEN      Next=Place_SA_in_Closed_SA_files
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Place the SA in the Closed SA files.
          No further action is required for this SA.

       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 6
IF        Form_318=No
THEN      Next=Complete_AFSC_Form_318
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Complete the AFSC 318 Form and send a copy
          to MMAR.  This officially notifies MMAR of
          the SARB decision.

       Press any key to continue..."
          WCLOSE 2
          CLS;
```

```
RULE 7
IF        Forward=No
THEN      Next=Send_copy_of_318_to_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          After completing the AFSC 318 Form, send a copy
          to MMAR.  This officially notifies MMAR of
          the SARB decision so they can prepare/process
          the 873 form.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 8
IF        Forward=Not_Sure
THEN      Next=Check_with_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Check with MMAR to see if they received a
          copy of the 318 Form.  This officially
          notifies MMAR of the SARB decision and they
          require the 318 Form before they can prepare/
          process the 873 Form.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 9
IF        Minutes=No
THEN      Next=Give_CCB_minutes_to_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Send a copy of the SARB Minutes to DAC.
          This officially notifies DAC of the SARB
          decision.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 10
IF        Minutes=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Check with the DAC representative.  DAC
          requires official notification of the SARB
          decision.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 12
IF        Form_873_to_MMDDTF=No OR Form_873_to_MMDDTF=Not_Sure
THEN      Next=Check_with_MMAR_and_MMDDTF
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR & MMDDTF to check the status
          of your SA.  MMDDTF needs to assign a TCTO
          number to your SA & return the 873 Form to
          MMAR before MMAR can send the 873 Form to
          MMAP.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 13
IF        MMAR_FORM_873=NO OR MMAR_FORM_873=NOT_SURE
THEN      Next=Check_with_MMAR_&_MMDDTF
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTF & MMAR to check the status
          of your SA.  MMDDTF needs to assign a TCTO
          number to your SA & return the 873 Form to
          MMAR before MMAR can send the 873 Form to
          MMAP.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 14
IF        Form_873=No
THEN      Next=Check_with_MMAR_and_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR to check the status of your
          SA.  MMAR needs to send the 873 Form to MMAP
          before they can complete the PR package.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 15
IF        Form_873=Not_Sure
THEN      Next=Check_with_MMAR_and_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR & MMAP to check the status of
          your SA.  MMAR needs to send the 873 Form
          to MMAP before they can complete the PR
          package.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 16
IF        PR=No
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP to check the status of your
          SA.  MMAP needs to complete the PR and send
          it to PMWBB.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 17
IF        PR=Not_Sure
THEN      Next=Check_with_MMAP_&_PMWBB
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP & PMWBB to check the status
          of your SA.  MMAP needs to complete the PR
          and send it to PMWBB.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 18
IF        PMWBB=No OR PMWBB=Not_Sure
THEN      Next=Check_with_PMWBB
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact PMWBB to check the status of your
          SA.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 20
IF        KITS=No or KITS=Not_Sure
THEN      Next=Inform_PMWBB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact PMWBB or DAC Representative to find
          out status of SA, because there may be
          contractual problems.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
```

```
RULE 21
IF        INSTALL4=No or INSTALL4=Not_Sure
THEN      Next=Inform_PMWBB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact ACO or DAC Representative to find
          out status of SA, because there may be
          kit delivery problems.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 22
IF        ACO=No or ACO=Not_Sure
THEN      Next=Inform_PMWBB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact ACO & DAC Representative
          to find out status of SA, because there
          may be problems.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 23
IF        TCTO=No or TCTO=Not_Sure
THEN      Next=Inform_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMDDTF to
          find out status of SA, because the TCTO
          coversheet has to be approved & printed
          before it can be incorporated on the
          aircraft.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 24
IF        Delivery_Date=No
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative to check the
          status of your SA, because MMAP has to be
          notified of Kit delivery before they can
          send a signed 875 Form to MMAR.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 25
IF        Delivery_Date=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMAP to
          find out status of SA, because the MMAP
          has to be notified of Kit delivery before
          they can send a signed 875 Form to MMAR
          & MMDDTF.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 26
IF        Schedule=No
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative to find out the
          status of your SA.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 27
IF        Schedule=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMAP to find
          out status of SA.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 28
IF        MMAP=Not_Sure
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
        Your next step in the SA process is to:

        Contact MMAR & MMAP to find out status
        of SA, because MMAP has to send a signed
        875 Form to MMAR before TCTO incorporation.

     Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 29
IF        MMAP=No
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP to find out status of your
          SA, MMAP has to send a signed 875 Form
          to MMAR before TCTO incorporation.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 30
IF        TCTO_Approved=No or TCTO_Approved=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTF to find out status of SA,
          because the TCTO coversheet has to be
          approved & printed before it can be
          incorporated on the aircraft.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 34
IF        Field_Receipt=No or Field_Receipt=Not_Sure
THEN      Next=Check_with_MMDDTF_&_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTPD to find out status of SA,
          because there may be problems.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 35
IF        Field_Receipt=Yes
THEN      Next=History
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Continue to track SA incorporation with
          the DAC CSAR system & D047.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
```

```
!!!!! Ask Statements
ASK SA: "Have you received a SA?";
CHOICES SA: Yes, No;

ASK ENG_EVAL: "Do you have an Engineering Evaluation on this SA?";
CHOICES ENG_EVAL: Yes, No;

ASK CCB: "Has the SA been presented at SARB?";
CHOICES CCB: Yes, No;

ASK RESULT: "What was the SARB decision?";
CHOICES RESULT: Approved, Disapproved;

ASK FORM_318: "Have you completed an AFSC Form 318?";
CHOICES FORM_318: Yes, No;

ASK FORWARD: "Have you sent a copy of the 318 Form to MMAR?";
CHOICES FORWARD: Yes, No, Not_Sure;

ASK MINUTES: "Has a copy of the SARB Minutes been sent to DAC?";
CHOICES MINUTES: Yes, No, Not_Sure;

ASK FORM_873_TO_MMDDTF: "Has MMAR sent the 873 Form to MMDDTF?";
CHOICES FORM_873_TO_MMDDTF: Yes, No, Not_Sure;

ASK MMAR_FORM_873: "Has MMDDTF assigned the TCTO number & returned
the 873 Form to MMAR?";
CHOICES MMAR_FORM_873: Yes, No, Not_Sure;

ASK FORM_873: "Has MMAP received the AFLC 873 Form & Procurement
Request Letter from MMAR?";
CHOICES FORM_873: Yes, No, Not_Sure;

ASK PR: "Has MMAP sent the Kit Procurement Letter to PMWBB?";
CHOICES PR: Yes, No, Not_Sure;

ASK PMWBB: "Has PMWBB authorized SA Kit Procurement?";
CHOICES PMWBB: Yes, No, Not_Sure;

ASK KITS: "Has DAC ordered the SA kits?";
CHOICES KITS: Yes, No, Not_Sure;

ASK INSTALL4: "Has DAC provided the ACO with installation hour
requirements?";
CHOICES INSTALL4: Yes, No, Not_Sure;

ASK ACO: "Has ACO approved the installation hour requirements?";
CHOICES ACO: Yes, No, Not_Sure;

ASK TCTO: "Has MMDDTF received the preliminary TCTO cover sheets
from DAC?";
Choices TCTO: Yes, No, Not_Sure;
```

```
ASK Delivery_Date: "Has DAC notified MMAP of kit delivery?";
Choices Delivery_Date: Yes, No, Not_Sure;

ASK Schedule: "Has DAC informed MMAP of the incorporation
schedule?";
Choices Schedule: Yes, No, Not_Sure;

ASK MMAP: "Has MMAR & MMDDTF received the signed AFLC Form 875 from
MMAP?";
Choices MMAP: Yes, No, Not_Sure;

ASK TCTO_Approved: "Has the TCTO cover sheets been approved?";
Choices TCTO_Approved: Yes, No, Not_Sure;

ASK Field_Receipt: "Has the TCTO/TO changes been printed &
distributed?";
Choices Field_Receipt: Yes, No, Not_Sure;

ASK Continue: "Do you want to update the SA status in the
database?";
Choices Continue: Yes, No;

^Z
```

```
!********** Depot Level No Kit Cost SA Process **********
! Filename SAFLOWD.KBS
EXECUTE;
ENDOFF;
RUNTIME;
BKCOLOR=7;

!!!!! Actions Block
ACTIONS
     LOADFACTS C:\KC10SA\FACTFILE
     COLOR=0
     WOPEN 1,5,9,8,60,7
     ACTIVE 1
     DISPLAY "
       This part of the KC-10 SA Advisor guides you
        through the DEPOT LEVEL NO KIT COST SA process.


   Press any key to begin the consultation...~"
     WCLOSE 1
     CLS
     FIND Next
     CLS
    RESET Continue
     FIND Continue

  WHILETRUE Continue=Yes THEN
    RESET Continue
    SAVEFACTS C:\KC10SA\FACTFILE
    CHAIN C:\KC10SA\ChangeSA
  END

  WHILETRUE Continue=No THEN
    RESET Continue
    SAVEFACTS C:\KC10SA\FACTFILE
    CHAIN C:\KC10SA\SA
  END
;
```

```
!!!!! Rules Statements
RULE 1
IF        SA=No AND
          ENG_EVAL=Yes
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative.  You should
          receive the SA document at the same time
          as MMAR.  SARB requires both documents.

        Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 2
IF        SA=Yes AND
          ENG_EVAL=No
THEN      Next=Wait_for_Eng_Eval_from_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Wait for an Engneering Evaluation from
          MMAR.  SARB requires both documents.

        Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 3
IF        SA=No AND
          ENG_EVAL=No
THEN      Next=Wait_for_SA_or_Eng_Eval_arrival
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Wait for a SA from DAC or an Engneering
          Evaluation from MMAR.  SA processing
          requires a SA!

        Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 4
IF        CCB=No
THEN      Next=Schedule_SA_for_CCB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Schedule the SA for SARB.

        Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 5
IF        RESULT=Disapproved
THEN      Next=Place_SA_in_Closed_SA_files
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Place the SA in the Closed SA files.
          No further action is required for this SA.

        Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 6
IF        Form_318=No
THEN      Next=Complete_AFSC_Form_318
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Complete the AFSC 318 Form and send a copy
          to MMAR.  This officially notifies MMAR of
          the SARB decision.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
```

```
RULE 7
IF        Forward=No
THEN      Next=Send_copy_of_318_to_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          After completing the AFSC 318 Form, send a copy
          to MMAR.  This officially notifies MMAR of
          the SARB decision so they can prepare/process
          the 873 form.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
RULE 8
IF        Forward=Not_Sure
THEN      Next=Check_with_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Check with MMAR to see if they received a
          copy of the 318 Form.  This officially
          notifies MMAR of the SARB decision and they
          require the 318 Form before they can prepare/
          process the 873 Form.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 9
IF        Minutes=No
THEN      Next=Give_CCB_minutes_to_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Send a copy of the SARB Minutes to DAC.
          This officially notifies DAC of the SARB
          decision.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 10
IF        Minutes=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Check with the DAC representative.  DAC
          requires official notification of the SARB
          decision.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 11
IF        Funds=No
THEN      Next=Give_Cost_Est_to_Funds_Mgr
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Give the cost estimate of your SA to the
          MMAK Funds Manager.  SA estimates are required
          to compute KC-10 budget estimates.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 12
IF        Form_873_to_MMDDTF=No OR Form_873_to_MMDDTF=Not_Sure
THEN      Next=Check_with_MMAR_and_MMDDTF
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR & MMDDTF to check the status
          of your SA.  MMDDTF needs to assign a TCTO
          number to your SA & return the 873 Form to
          MMAR before MMAR can send the 873 Form to
          MMAP.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 13
IF        MMAR_FORM_873=NO OR MMAR_FORM_873=NOT_SURE
THEN      Next=Check_with_MMAR_&_MMDDTF
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTF & MMAR to check the status
          of your SA.  MMDDTF needs to assign a TCTO
          number to your SA & return the 873 Form to
          MMAR before MMAR can send the 873 Form to
          MMAP.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 14
IF        Form_873=No
THEN      Next=Check_with_MMAR_and_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR to check the status of your
          SA.  MMAR needs to send the 873 Form to MMAP
          before they can complete the PR package.


       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 15
IF        Form_873=Not_Sure
THEN      Next=Check_with_MMAR_and_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR & MMAP to check the status of
          your SA.  MMAR needs to send the 873 Form
          to MMAP before they can complete the PR
          package.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 16
IF        PR=No
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP to check the status of your
          SA.  MMAP needs to complete the PR and send
          it to PMWBB.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 17
IF        PR=Not_Sure
THEN      Next=Check_with_MMAP_&_PMWBB
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP & PMWBB to check the status
          of your SA.  MMAP needs to complete the PR
          and send it to PMWBB.


       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 18
IF        PMWBB=No OR PMWBB=Not_Sure
THEN      Next=Check_with_PMWBB
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact PMWBB to check the status of your
          SA.

        Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 20
IF        KITS=No or KITS=Not_Sure
THEN      Next=Inform_PMWBB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact PMWBB or DAC Representative to find
          out status of SA, because there may be
          contractual problems.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 20b
IF        O&A=No or O&A=Not_Sure
THEN      Next=Inform_PMWBB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact ACO or DAC to find out status of SA,
          because there may be problems.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 22
IF        ACO=No or ACO=Not_Sure
THEN      Next=Inform_PMWBB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact ACO & DAC Representative
          to find out status of SA, because there
          may be problems.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 23
IF        TCTO=No or TCTO=Not_Sure
THEN      Next=Inform_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMDDTF to
          find out status of SA, because the TCTO
          coversheet has to be approved & printed
          before it can be incorporated on the
          aircraft.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 24
IF        Delivery_Date=No
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative to check the
          status of your SA, because MMAP has to be
          notified of Kit delivery before they can
          send a signed 875 Form to MMAR.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 25
IF        Delivery_Date=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMAP to
          find out status of SA, because the MMAP
          has to be notified of Kit delivery before
          they can send a signed 875 Form to MMAR
          & MMDDTF.
       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 26
IF        Schedule=No
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative to find out the
          status of your SA.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 27
IF        Schedule=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMAP to find
          out status of SA.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 28
IF        MMAP=Not_Sure
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
        Your next step in the SA process is to:

        Contact MMAR & MMAP to find out status
        of SA, because MMAP has to send a signed
        875 Form to MMAR before TCTO incorporation.

    Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 29
IF        MMAP=No
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP to find out status of your
          SA, MMAP has to send a signed 875 Form
          to MMAR before TCTO incorporation.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 30
IF        TCTO_Approved=No or TCTO_Approved=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTF to find out status of SA,
          because the TCTO coversheet has to be
          approved & printed before it can be
          incorporated on the aircraft.

       Press any key to continue..."
"         WCLOSE 2
          CLS;


RULE 34
IF        Field_Receipt=No or Field_Receipt=Not_Sure
THEN      Next=Check_with_MMDDTF_&_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTPD to find out status of SA,
          because there may be problems.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
```

```
RULE 35
IF        Field_Receipt=Yes
THEN      Next=History
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Continue to track SA incorporation with
          the DAC CSAR system & D047.

       Press any key to continue..."
          WCLOSE 2
          CLS;

!!!!! Ask Statements
ASK SA: "Have you received a SA?";
CHOICES SA: Yes, No;

ASK ENG_EVAL: "Do you have an Engineering Evaluation on this SA?";
CHOICES ENG_EVAL: Yes, No;

ASK CCB: "Has the SA been presented at SARB?";
CHOICES CCB: Yes, No;

ASK RESULT: "What was the SARB decision?";
CHOICES RESULT: Approved, Disapproved;

ASK FORM_318: "Have you completed an AFSC Form 318?";
CHOICES FORM_318: Yes, No;

ASK FORWARD: "Have you sent a copy of the 318 Form to MMAR?";
CHOICES FORWARD: Yes, No, Not_Sure;

ASK MINUTES: "Has a copy of the SARB Minutes been sent to DAC?";
CHOICES MINUTES: Yes, No, Not_Sure;

ASK FUNDS: "Have you told the Funds Mgr of the estimated costs of
your SA?";
CHOICES FUNDS: Yes, No;

ASK FORM_873_TO_MMDDTF: "Has MMAR sent the 873 Form to MMDDTF?";
CHOICES FORM_873_TO_MMDDTF: Yes, No, Not_Sure;

ASK MMAR_FORM_873: "Has MMDDTF assigned the TCTO number & returned
the 873 Form to MMAR?";
CHOICES MMAR_FORM_873: Yes, No, Not_Sure;
```

```
ASK FORM_873: "Has MMAP received the AFLC 873 Form & Procurement
Request Letter from MMAR?";
CHOICES FORM_873: Yes, No, Not_Sure;

ASK PR: "Has MMAP processed the Kit Procurement Letter through to
PMWBB?";
CHOICES PR: Yes, No, Not_Sure;

ASK PMWBB: "Has PMWBB authorized SA kit procurement?";
CHOICES PMWBB: Yes, No, Not_Sure;

ASK KITS: "Has DAC ordered the SA kits?";
CHOICES KITS: Yes, No, Not_Sure;

ASK O&A: "Has DAC provided the ACO Over & Above costs for
installation?";
CHOICES O&A: Yes, No, Not_Sure;

ASK ACO: "Has ACO approved the installation hour requirements?";
CHOICES ACO: Yes, No, Not_Sure;

ASK TCTO: "Has MMDDTF received the preliminary TCTO cover sheets
from DAC?";
Choices TCTO: Yes, No, Not_Sure;

ASK Delivery_Date: "Has DAC notified MMAP of kit delivery?";
Choices Delivery_Date: Yes, No, Not_Sure;

ASK Schedule: "Has DAC informed MMAP of the incorporation
schedule?";
Choices Schedule: Yes, No, Not_Sure;

ASK MMAP: "Has MMAR & MMDDTF received the signed AFLC Form 875 from
MMAP?";
Choices MMAP: Yes, No, Not_Sure;

ASK TCTO_Approved: "Has the TCTO cover sheets been approved?";
Choices TCTO_Approved: Yes, No, Not_Sure;

ASK Field_Receipt: "Has the TCTO/TO changes been printed &
distributed?";
Choices Field_Receipt: Yes, No, Not_Sure;

ASK Continue: "Do you want to update the SA status in the
database?";
Choices Continue: Yes, No;

^Z
```

```
!********** Normal Base Level SA Process **********
! Filename BSAFLOW.KBS

EXECUTE;
ENDOFF;
RUNTIME;
BKCOLOR=7;

!!!!! Actions Block
ACTIONS
     LOADFACTS C:\KC10SA\FACTFILE
     COLOR=0
     WOPEN 1,5,9,8,60,7
     ACTIVE 1
     DISPLAY "
   This part of the KC-10 SA Advisor guides you
     through the NORMAL BASE LEVEL SA process.


   Press any key to begin the consultation...~"
     WCLOSE 1
     CLS
     FIND Next
     CLS
    RESET Continue
     FIND Continue

  WHILETRUE Continue=Yes THEN
    RESET Continue
    SAVEFACTS C:\KC10SA\FACTFILE
    CHAIN C:\KC10SA\ChangeSA
  END

  WHILETRUE Continue=No THEN
    RESET Continue
    SAVEFACTS C:\KC10SA\FACTFILE
    CHAIN C:\KC10SA\SA
  END
;
```

```
!!!!! Rules Statements
RULE 1
IF        SA=No AND
          ENG_EVAL=Yes
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative.  You should
          receive the SA document at the same time
          as MMAR.  SARB requires both documents.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 2
IF        SA=Yes AND
          ENG_EVAL=No
THEN      Next=Wait_for_Eng_Eval_from_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Wait for an Engneering Evaluation from
          MMAR.  SARB requires both documents.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 3
IF        SA=No AND
          ENG_EVAL=No
THEN      Next=Wait_for_SA_or_Eng_Eval_arrival
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Wait for a SA from DAC or an Engneering
          Evaluation from MMAR.  SA processing
          requires a SA!

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 4
IF        CCB=No
THEN      Next=Schedule_SA_for_CCB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Schedule the SA for SARB.

       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 5
IF        RESULT=Disapproved
THEN      Next=Place_SA_in_Closed_SA_files
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Place the SA in the Closed SA files.
          No further action is required for this SA.

        Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 6
IF        Form_318=No
THEN      Next=Complete_AFSC_Form_318
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Complete the AFSC 318 Form and send a copy
          to MMAR.  This officially notifies MMAR of
          the SARB decision.

       Press any key to continue..."
          WCLOSE 2
          CLS;
```

```
RULE 7
IF        Forward=No
THEN      Next=Send_copy_of_318_to_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          After completing the AFSC 318 Form, send a copy
          to MMAR.  This officially notifies MMAR of
          the SARB decision so they can prepare/process
          the 873 form.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 8
IF        Forward=Not_Sure
THEN      Next=Check_with_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Check with MMAR to see if they received a
          copy of the 318 Form.  This officially
          notifies MMAR of the SARB decision and they
          require the 318 Form before they can prepare/
          process the 873 Form.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 9
IF        Minutes=No
THEN      Next=Give_CCB_minutes_to_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Send a copy of the SARB Minutes to DAC.
          This officially notifies DAC of the SARB
          decision.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 10
IF        Minutes=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Check with the DAC representative.  DAC
          requires official notification of the SARB
          decision.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 11
IF        Funds=No
THEN      Next=Give_Cost_Est_to_Funds_Mgr
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Give the cost estimate of your SA to the
          MMAK Funds Manager.  SA estimates are required
          to compute KC-10 budget estimates.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 12
IF        Form_873_to_MMDDTF=No OR Form_873_to_MMDDTF=Not_Sure
THEN      Next=Check_with_MMAR_and_MMDDTF
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR & MMDDTF to check the status
          of your SA.  MMDDTF needs to assign a TCTO
          number to your SA & return the 873 Form to
          MMAR before MMAR can send the 873 Form to
          MMAP.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 13
IF        MMAR_FORM_873=NO OR MMAR_FORM_873=NOT_SURE
THEN      Next=Check_with_MMAR_&_MMDDTF
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTF & MMAR to check the status
          of your SA.  MMDDTF needs to assign a TCTO
          number to your SA & return the 873 Form to
          MMAR before MMAR can send the 873 Form to
          MMAP.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 14
IF        Form_873=No
THEN      Next=Check_with_MMAR_and_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR to check the status of your
          SA.  MMAR needs to send the 873 Form to MMAP
          before they can complete the PR package.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 15
IF        Form_873=Not_Sure
THEN      Next=Check_with_MMAR_and_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR & MMAP to check the status of
          your SA.  MMAR needs to send the 873 Form
          to MMAP before they can complete the PR
          package.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 16
IF        PR=No
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP to check the status of your
          SA.  MMAP needs to complete the PR and send
          it to PMWBB.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 17
IF        PR=Not_Sure
THEN      Next=Check_with_MMAP_&_PMWBB
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP & PMWBB to check the status
          of your SA.  MMAP needs to complete the PR
          and send it to PMWBB.


       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 18
IF        PMWBB=No OR PMWBB=Not_Sure
THEN      Next=Check_with_PMWBB
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact PMWBB to check the status of your
          SA.

        Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 20
IF        KITS=No or KITS=Not_Sure
THEN      Next=Inform_PMWBB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact PMWBB or DAC Representative to find
          out status of SA, because there may be
          contractual problems.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 23
IF        TCTO=No or TCTO=Not_Sure
THEN      Next=Inform_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMDDTF to
          find out status of SA, because the TCTO
          coversheet has to be approved & printed
          before it can be incorporated on the
          aircraft.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 24
IF        Delivery_Date=No
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative to check the
          status of your SA, because MMAP has to be
          notified of Kit delivery before they can
          send a signed 875 Form to MMAR.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 25
IF        Delivery_Date=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMAP to
          find out status of SA, because the MMAP
          has to be notified of Kit delivery before
          they can send a signed 875 Form to MMAR
          & MMDDTF.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 26
IF        Schedule=No
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative to find out the
          status of your SA.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 27
IF        Schedule=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMAP to find
          out status of SA.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
```

```
RULE 28
IF        MMAP=Not_Sure
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
        Your next step in the SA process is to:

        Contact MMAR & MMAP to find out status
        of SA, because MMAP has to send a signed
        875 Form to MMAR before TCTO incorporation.

     Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 29
IF        MMAP=No
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP to find out status of your
          SA, MMAP has to send a signed 875 Form
          to MMAR before TCTO incorporation.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 30
IF        TCTO_Approved=No or TCTO_Approved=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTF to find out status of SA,
          because the TCTO coversheet has to be
          approved & printed before it can be
          incorporated on the aircraft.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 32
IF        Printing=No or Printing=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTPD to find out status of SA,
          because the TCTO coversheet has to be
          approved & printed before it can be
          incorporated on the aircraft.

       Press any key to continue..."
"         WCLOSE 2
          CLS;


RULE 34
IF        Field_Receipt=No or Field_Receipt=Not_Sure
THEN      Next=Check_with_MMDDTF_&_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTPD to find out status of SA,
          because there may be problems.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 35
IF        Field_Receipt=Yes
THEN      Next=History
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Continue to track SA incorporation with
          the DAC CSAR system & DO47.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
```

```
!!!!! Ask Statements
ASK SA: "Have you received a SA?";
CHOICES SA: Yes, No;

ASK ENG_EVAL: "Do you have an Engineering Evaluation on this SA?";
CHOICES ENG_EVAL: Yes, No;

ASK CCB: "Has the SA been presented at SARB?";
CHOICES CCB: Yes, No;

ASK RESULT: "What was the SARB decision?";
CHOICES RESULT: Approved, Disapproved;

ASK FORM_318: "Have you completed an AFSC Form 318?";
CHOICES FORM_318: Yes, No;

ASK FORWARD: "Have you sent a copy of the 318 Form to MMAR?";
CHOICES FORWARD: Yes, No, Not_Sure;

ASK MINUTES: "Has a copy of the SARB Minutes been sent to DAC?";
CHOICES MINUTES: Yes, No, Not_Sure;

ASK FUNDS: "Have you told the Funds Mgr of the estimated costs of
your SA?";
CHOICES FUNDS: Yes, No;

ASK FORM_873_TO_MMDDTF: "Has MMAR sent the 873 Form to MMDDTF?";
CHOICES FORM_873_TO_MMDDTF: Yes, No, Not_Sure;

ASK MMAR_FORM_873: "Has MMDDTF assigned the TCTO number & returned
the 873 Form to MMAR?";
CHOICES MMAR_FORM_873: Yes, No, Not_Sure;

ASK FORM_873: "Has MMAP received the AFLC 873 Form & Procurement
Request Letter from MMAR?";
CHOICES FORM_873: Yes, No, Not_Sure;

ASK PR: "Has MMAP processed the PR through to PMWBB?";
CHOICES PR: Yes, No, Not_Sure;

ASK PMWBB: "Has PMWBB authorized SA Kit Purchase?";
CHOICES PMWBB: Yes, No, Not_Sure;

ASK KITS: "Has DAC ordered the SA kits?";
CHOICES KITS: Yes, No, Not_Sure;

ASK TCTO: "Has MMDDTF received the preliminary TCTO cover sheets
from DAC?";
Choices TCTO: Yes, No, Not_Sure;

ASK Delivery_Date: "Has DAC notified MMAP of kit delivery?";
Choices Delivery_Date: Yes, No, Not_Sure;
```

```
ASK MMAP: "Has MMAR & MMDDTF received the signed AFLC Form 875 from
MMAP?";
Choices MMAP: Yes, No, Not_Sure;

ASK TCTO_Approved: "Has the TCTO cover sheets been approved?";
Choices TCTO_Approved: Yes, No, Not_Sure;

ASK Field_Receipt: "Has the TCTO/TO changes been printed &
distributed?";
Choices Field_Receipt: Yes, No, Not_Sure;

ASK Continue: "Do you want to update the SA status in the
database?";
Choices Continue: Yes, No;

^Z
```

```
!********** No Cost Base Level SA Process **********
! Filename BSAFLOWB.KBS

EXECUTE;
ENDOFF;
RUNTIME;
BKCOLOR=7;

!!!!! Actions Block
ACTIONS
     LOADFACTS C:\KC10SA\FACTFILE
     COLOR=0
     WOPEN 1,5,9,8,60,7
     ACTIVE 1
     DISPLAY "
   This part of the KC-10 SA Advisor guides you
     through the NO COST BASE LEVEL SA process.


   Press any key to begin the consultation..."
     WCLOSE 1
     CLS
     FIND Next
     CLS
    RESET Continue
     FIND Continue

  WHILETRUE Continue=Yes THEN
    RESET Continue
    SAVEFACTS C:\KC10SA\FACTFILE
    CHAIN C:\KC10SA\ChangeSA
  END

  WHILETRUE Continue=No THEN
    RESET Continue
    SAVEFACTS C:\KC10SA\FACTFILE
    CHAIN C:\KC10SA\SA
  END
;
```

```
!!!!! Rules Statements
RULE 1
IF        SA=No AND
          ENG_EVAL=Yes
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative.  You should
          receive the SA document at the same time
          as MMAR.  SARB requires both documents.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 2
IF        SA=Yes AND
          ENG_EVAL=No
THEN      Next=Wait_for_Eng_Eval_from_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Wait for an Engneering Evaluation from
          MMAR.  SARB requires both documents.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 3
IF        SA=No AND
          ENG_EVAL=No
THEN      Next=Wait_for_SA_or_Eng_Eval_arrival
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Wait for a SA from DAC or an Engneering
          Evaluation from MMAR.  SA processing
          requires a SA!

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 4
IF        CCB=No
THEN      Next=Schedule_SA_for_CCB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Schedule the SA for SARB.

       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 5
IF        RESULT=Disapproved
THEN      Next=Place_SA_in_Closed_SA_files
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Place the SA in the Closed SA files.
          No further action is required for this SA.


       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 6
IF        Form_318=No
THEN      Next=Complete_AFSC_Form_318
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Complete the AFSC 318 Form and send a copy
          to MMAR.  This officially notifies MMAR of
          the SARB decision.

       Press any key to continue..."
          WCLOSE 2
          CLS;
```

```
RULE 7
IF        Forward=No
THEN      Next=Send_copy_of_318_to_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          After completing the AFSC 318 Form, send a copy
          to MMAR.  This officially notifies MMAR of
          the SARB decision so they can prepare/process
          the 873 form.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 8
IF        Forward=Not_Sure
THEN      Next=Check_with_MMAR
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Check with MMAR to see if they received a
          copy of the 318 Form.  This officially
          notifies MMAR of the SARB decision and they
          require the 318 Form before they can prepare/
          process the 873 Form.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 9
IF        Minutes=No
THEN      Next=Give_CCB_minutes_to_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Send a copy of the SARB Minutes to DAC.
          This officially notifies DAC of the SARB
          decision.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 10
IF        Minutes=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Check with the DAC representative.  DAC
          requires official notification of the SARB
          decision.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 12
IF        Form_873_to_MMDDTF=No OR Form_873_to_MMDDTF=Not_Sure
THEN      Next=Check_with_MMAR_and_MMDDTF
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR & MMDDTF to check the status
          of your SA.  MMDDTF needs to assign a TCTO
          number to your SA & return the 873 Form to
          MMAR before MMAR can send the 873 Form to
          MMAP.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 13
IF        MMAR_FORM_873=NO OR MMAR_FORM_873=NOT_SURE
THEN      Next=Check_with_MMAR_&_MMDDTF
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTF & MMAR to check the status
          of your SA.  MMDDTF needs to assign a TCTO
          number to your SA & return the 873 Form to
          MMAR before MMAR can send the 873 Form to
          MMAP.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 14
IF        Form_873=No
THEN      Next=Check_with_MMAR_and_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR to check the status of your
          SA.  MMAR needs to send the 873 Form to MMAP
          before they can complete the PR package.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 15
IF        Form_873=Not_Sure
THEN      Next=Check_with_MMAR_and_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAR & MMAP to check the status of
          your SA.  MMAR needs to send the 873 Form
          to MMAP before they can complete the PR
          package.

       Press any key to continue..." "
          WCLOSE 2
          CLS;

RULE 16
IF        PR=No
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP to check the status of your
          SA.  MMAP needs to complete the PR and send
          it to PMWBB.

       Press any key to continue..." "
          WCLOSE 2
          CLS;
```

```
RULE 17
IF        PR=Not_Sure
THEN      Next=Check_with_MMAP_&_PMWBB
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP & PMWBB to check the status
          of your SA.  MMAP needs to complete the PR
          and send it to PMWBB.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 18
IF        PMWBB=No OR PMWBB=Not_Sure
THEN      Next=Check_with_PMWBB
          CLS
          WOPEN 2,3,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact PMWBB to check the status of your
          SA.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 20
IF        KITS=No or KITS=Not_Sure
THEN      Next=Inform_PMWBB
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact PMWBB or DAC Representative to find
          out status of SA, because there may be
          contractual problems.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;
```

```
RULE 23
IF        TCTO=No or TCTO=Not_Sure
THEN      Next=Inform_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMDDTF to
          find out status of SA, because the TCTO
          coversheet has to be approved & printed
          before it can be incorporated on the
          aircraft.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 24
IF        Delivery_Date=No
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative to check the
          status of your SA, because MMAP has to be
          notified of Kit delivery before they can
          send a signed 875 Form to MMAR.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
RULE 25
IF        Delivery_Date=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMAP to
          find out status of SA, because the MMAP
          has to be notified of Kit delivery before
          they can send a signed 875 Form to MMAR
          & MMDDTF.
       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 26
IF        Schedule=No
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative to find out the
          status of your SA.

       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 27
IF        Schedule=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact DAC Representative & MMAP to find
          out status of SA.

       Press any key to continue..."
          WCLOSE 2
          CLS;

RULE 28
IF        MMAP=Not_Sure
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
         Your next step in the SA process is to:

         Contact MMAR & MMAP to find out status
         of SA, because MMAP has to send a signed
         875 Form to MMAR before TCTO incorporation.

     Press any key to continue..."
          WCLOSE 2
          CLS;
```

```
RULE 29
IF        MMAP=No
THEN      Next=Check_with_MMAP
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMAP to find out status of your
          SA, MMAP has to send a signed 875 Form
          to MMAR before TCTO incorporation.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 30
IF        TCTO_Approved=No or TCTO_Approved=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTF to find out status of SA,
          because the TCTO coversheet has to be
          approved & printed before it can be
          incorporated on the aircraft.

       Press any key to continue..."
"         WCLOSE 2
          CLS;

RULE 32
IF        Printing=No or Printing=Not_Sure
THEN      Next=Check_with_DAC_Rep
          CLS
          WOPEN 2,4,9,12,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTPD to find out status of SA,
          because the TCTO coversheet has to be
          approved & printed before it can be
          incorporated on the aircraft.

       Press any key to continue..."
"         WCLOSE 2
          CLS;
```

```
RULE 34
IF        Field_Receipt=No or Field_Receipt=Not_Sure
THEN      Next=Check_with_MMDDTF_&_DAC_Rep
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Contact MMDDTPD to find out status of SA,
          because there may be problems.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

RULE 35
IF        Field_Receipt=Yes
THEN      Next=History
          CLS
          WOPEN 2,4,9,10,60,7
          ACTIVE 2
          DISPLAY "
          Your next step in the SA process is to:

          Continue to track SA incorporation with
          the DAC CSAR system & DO47.

       Press any key to continue..."
"
          WCLOSE 2
          CLS;

!!!!! Ask Statements
ASK SA: "Have you received a SA?";
CHOICES SA: Yes, No;

ASK ENG_EVAL: "Do you have an Engineering Evaluation on this SA?";
CHOICES ENG_EVAL: Yes, No;

ASK CCB: "Has the SA been presented at SARB?";
CHOICES CCB: Yes, No;

ASK RESULT: "What was the SARB decision?";
CHOICES RESULT: Approved, Disapproved;

ASK FORM_318: "Have you completed an AFSC Form 318?";
CHOICES FORM_318: Yes, No;

ASK FORWARD: "Have you sent a copy of the 318 Form to MMAR?";
CHOICES FORWARD: Yes, No, Not_Sure;
```

```
ASK MINUTES: "Has a copy of the SARB Minutes been sent to DAC?";
CHOICES MINUTES: Yes, No, Not_Sure;

ASK FORM_873_TO_MMDDTF: "Has MMAR sent the 873 Form to MMDDTF?";
CHOICES FORM_873_TO_MMDDTF: Yes, No, Not_Sure;

ASK MMAR_FORM_873: "Has MMDDTF assigned the TCTO number & returned
the 873 Form to MMAR?";
CHOICES MMAR_FORM_873: Yes, No, Not_Sure;

ASK FORM_873: "Has MMAP received the AFLC 873 Form & Procurement
Request Letter from MMAR?";
CHOICES FORM_873: Yes, No, Not_Sure;

ASK PR: "Has MMAP processed the Kit Procurement Letter through to
PMWBB?";
CHOICES PR: Yes, No, Not_Sure;

ASK PMWBB: "Has PMWBB authorized SA Kit Procurement?";
CHOICES PMWBB: Yes, No, Not_Sure;

ASK KITS: "Has DAC ordered the SA kits?";
CHOICES KITS: Yes, No, Not_Sure;

ASK TCTO: "Has MMDDTF received the preliminary TCTO cover sheets
from DAC?";
Choices TCTO: Yes, No, Not_Sure;

ASK Delivery_Date: "Has DAC notified MMAP of kit delivery?";
Choices Delivery_Date: Yes, No, Not_Sure;

ASK MMAP: "Has MMAR & MMDDTF received the signed AFLC Form 875 from
MMAP?";
Choices MMAP: Yes, No, Not_Sure;

ASK TCTO_Approved: "Has the TCTO cover sheets been approved?";
Choices TCTO_Approved: Yes, No, Not_Sure;

ASK Field_Receipt: "Has the TCTO/TO changes been printed &
distributed?";
Choices Field_Receipt: Yes, No, Not_Sure;

ASK Continue: "Do you want to update the SA status in the
database?";
Choices Continue: Yes, No;

^Z
```

```
! This module allows addition of new SAs to the database.
! Filename ADD_SA.KBS
EXECUTE;
ENDOFF;
RUNTIME;
BKCOLOR=7;
!!!!! Actions Block
ACTIONS
   CLOSE C:\KC10SA\KC10
   COLOR=0
   WOPEN 1,4,7,15,65,7
   ACTIVE 1
   DISPLAY "
       This part of the KC-10 Service Action Advisor allows
  you to add SAs to the database.  PLEASE TYPE CAREFULLY, if
  you make a mistake you will need to exit the KC-10 Service
  Action Advisor and choose Option 4: 'Change information in
  the Service Action Data Base' to correct mistakes.   "
   FIND Check
   WCLOSE 1
   CLS
WHILETRUE Check=Continue THEN
  RESET Check
END

WHILETRUE Check=Main_Menu THEN
  RESET Check
  CHAIN C:\KC10SA\SA
END

WHILEKNOWN Addition
   CLS
   FIND New_Manager
   PROGMGR = (New_Manager)
   CLS
   FIND New_SAType
   SAType = (New_SAType)
   CLS
   FIND New_SANumber
   SANumber = (New_SANumber)
   CLS
   FIND New_SATitle
   SATitle = (New_SATitle)
   CLS
   FIND New_DATEA
   DATEA = (New_DATEA)
   CLS
   FIND New_Status
   Status = (New_Status)
   CLS
   FIND New_Remarks
   Remarks = (New_Remarks)
```

```
   CLS
APPEND C:\KC10SA\KC10
CLS
   DISPLAY "
     You   have   added   {SAType}   {SANumber}   to   {PROGMGR}'s
responsibilities.
     Title: {SATitle}
     The SA was recieved on: {DATEA}
     The current status is: {Status}
     Remarks: {Remarks}

Press any key to continue...
"
   RESET New_Manager
   RESET New_SAType
   RESET New_SANumber
   RESET New_SATitle
   RESET New_DateA
   RESET New_Status
   RESET New_Remarks
   CHAIN C:\KC10SA\SA
END;

!!!!! Statements Block
ASK Check:"   Do you want to Continue or go back to the Main Menu?
";
CHOICES Check: Continue, Main_Menu;

ASK New_Manager: "  Which Program Manager has responsibility for
this SA?

  **NOTE** Type the Program Manager's initials the way you want it
           stored in the database.... Then, press ENTER.

Examples:JF,AML,PR,MH,GH,AM,CB,SH,RC,BF,ADL,TM,LS,TT,KW,RW,JB,CJF
";

ASK New_SAType: "   {New_Manager}, select the new SA's type by
moving the curser over your choice and pressing ENTER.
";
CHOICES New_SAType: SB,AD,ADM,ASB,AOL,GESB,SL,SBCN;

ASK New_SANumber: " Type the number that follows {New_SAType}.....
THEN press ENTER.

**NOTE** Include applicable revision number associated with the
{New_SAType}.
";

ASK New_SATitle: "  Type the title of your SA, using less than 70
spaces.
";
```

```
ASK New_DateA: "  {New_Manager}, what day did you receive the SA?
**NOTE** Please, enter the date as: YYYYMMDD
";

ASK New_Status: "  {New_Manager}, what is the current status of the
SA?
";
CHOICES    New_Status:    In_Development,    Waiting_SA_Document,
Waiting_Eng_Eval, Awaiting_SARB, Completing_318, MMAR_873_Process,
MMDDTF_873_Process,    MMAP_PR_Process,    PMWBB_Negotiations,
Kit_Order_Process,   Wait_Install_Reqmts,   ACO_Install_Approval,
Wait_DAC_Coversheet,  Coversheet_Approval,  Waiting_Kit_Delivery,
MMAP_875_Process, MMAR_875_Process, Wait_Install_Schedule,
Waiting_Kit_Payment, TCTO_Printing, Wait_Install_Payment,
Waiting_Field_Recpt, History_File;

ASK New_Remarks: "  Type any remarks.
";
^Z
```

```
! This module allows updates to the recorded SA status.
! Filename: CHANGESA.KBS
EXECUTE;                    ! Runs system automatically
ENDOFF;                     ! Enables enter key selection
RUNTIME;                    ! Turns off trace windows
BKCOLOR=7;                  ! Sets background color to light blue
!!!!! Actions Block
ACTIONS
   LOADFACTS C:\KC10SA\FACTFILE
   COLOR=0
   WOPEN 1,5,9,12,60,7
   ACTIVE 1
   DISPLAY "
       This part of the KC-10 Service Action Advisor
       allows updates to be written to the database.
"
   FIND Check
   WCLOSE 1
   CLS                      ! Clears screen

WHILETRUE Check=Continue THEN
   CLS
   RESET Check
   FIND SAMgr
END

WHILETRUE Check=Main_Menu THEN
   CLS
   RESET Check
   CHAIN C:\KC10SA\SA
END

WHILEKNOWN Change
  MENU SA_Num,SAMgr=PROGMGR,C:\KC10SA\KC10,SANumber
  FIND SA_Num
  GET SA_Num=SANUMBER,C:\KC10SA\KC10,Status
  CLS
  DISPLAY "The last recorded status for {SA_Num} is {Status}."
  RESET New_Status
  FIND New_Status
  Status=(New_Status)
  PUT C:\KC10SA\KC10
  DISPLAY "Now the recorded status for {SA_Num} is {New_Status}.

Press any key to continue..."
  CLOSE C:\KC10SA\KC10
  RESET Change
  FIND Change
  CLS
  SAVEFACTS C:\KC10SA\FACTFILE
  CHAIN C:\KC10SA\SA
END;
```

```
!!!!! Ask Statements
ASK Check:"  Do you want to Continue or go back to the Main Menu?
";
Choices Check:      Continue, Main_Menu;

ASK SAMgr: "  Which Program Manager's SA do you want to update?

  **NOTE** Type the initials of the Program Manager.... Then, press
ENTER.

EXAMPLES:JF,AML,PR,MH,GH,AM,CB,SH,BF,ADL,TM,LS,TT,KW,RC,RW,JB,CJF

";

ASK SA_Num: "Which SA do you want to change?";

ASK New_Status: "What should the recorded status for {SA_Num} be?
";
Choices    New_Status:    In_Development,    Waiting_SA_Document,
Waiting_Eng_Eval, Awaiting_SARB, Completing_318, MMAR_873_Process,
MMDDTF_873_Process,    MMAP_PR_Process,    PMWBB_Negotiations,
Kit_Order_Process,    Wait_Install_Reqmts,    ACO_Install_Approval,
Wait_DAC_Coversheet,  Coversheet_Approval,  Waiting_Kit_Delivery,
MMAP_875_Process,     MMAR_875_Process,     Wait_Install_Schedule,
Waiting_Kit_Payment,     TCTO_Printing,     Wait_Install_Payment,
Waiting_Field_Recpt, History_File;
^Z
```

```
! This module allows corrections to the recorded SA status.
! Filename: CORRECT.KBS

EXECUTE;
ENDOFF;
RUNTIME;
BKCOLOR=7;

!!!!! Actions Block
ACTIONS
   COLOR=0
   WOPEN 1,6,9,10,60,7
   ACTIVE 1
   DISPLAY "
       This part of the KC-10 Service Action Advisor
       allows you to make corrections in the database.

"
   FIND Check
   WCLOSE 1
   CLS

  WHILETRUE Check=Continue THEN
    CLS
    RESET Check
    FIND SAMgr
  END

  WHILETRUE Check=Main_Menu THEN
    RESET Check
    CHAIN C:\KC10SA\SA
  END

     WHILEKNOWN Change
       RESET SA_Num
       MENU SA_Num,SAMgr=PROGMGR,C:\KC10SA\KC10,SANumber
       FIND SA_Num
       MRESET SA_Num
        GET SA_Num=SANUMBER,C:\KC10SA\KC10,All
        CLS
        DISPLAY "
     You have chosen {PROGMGR}'s  {SAType} {SANumber}
     Title: {SATitle}
     Received on: {DateA}
     With a recorded status of: {Status}
     Remarks: {Remarks}

     Press any key to continue..."
"
     RESET Change
   END
```

```
FIND QPROGMGR

   WHILETRUE QPROGMGR=Yes THEN
        RESET New_PROGMGR
        FIND New_PROGMGR
        PROGMGR=(New_PROGMGR)
        PUT C:\KC1OSA\KC1O
        CLS
        DISPLAY "
     Now, the recorded information for {SAType} {SANumber}
     Title: {SATitle}
     With a status of: {Status}
     Received on: {DateA}
     Belongs to {New_PROGMGR}
     Remarks: {Remarks} "
     RESET QPROGMGR
   END

FIND QSAType
   WHILETRUE QSAType=Yes THEN
        RESET New_SAType
        FIND New_SAType
        SAType=(New_SAType)
        PUT C:\KC1OSA\KC1O
        CLS
        DISPLAY "
     Now, the recorded information for {PROGMGR}'s {SAType}
{SANumber}
     Title: {SATitle}
     Shows a status of: {Status}
     Received on: {DateA}
     Remarks: {Remarks} "
     RESET QSAType
   END

FIND QSA_Num
   WHILETRUE QSA_Num=Yes THEN
        RESET New_SANumber
        FIND New_SANumber
        SANumber=(New_SANumber)
        PUT C:\KC1OSA\KC1O
        CLS
        DISPLAY "
     Now, the recorded information for {PROGMGR}'s {SAType}
{SANumber}
     Title: {SATitle}
     Shows a status of: {Status}
     Received on: {DateA}
     Remarks: {Remarks} "
     RESET QSA_Num
   END
```

```
     FIND QSATitle
WHILETRUE QSATitle = Yes THEN
     Reset New_SATitle
     FIND New_SATitle
     SATitle = (New_SATitle)
     PUT C:\KC10SA\KC10
     CLS
     DISPLAY "
     Now, the recorded information for {PROGMGR}'s {SAType}
{SANumber}
     Title: {SATitle}
     Shows a status of: {Status}
     Received on: {DateA}
     Remarks: {Remarks}
"
     Reset QSATitle
END

FIND QStatus
   WHILETRUE QStatus=Yes THEN
       RESET New_Status
        FIND New_Status
        Status=(New_Status)
        PUT C:\KC10SA\KC10
        CLS
        DISPLAY "
     Now, the recorded information for {PROGMGR}'s {SAType}
{SANumber}
     Title: {SATitle}
     Shows a status of: {Status}
     Received on: {DateA}
     Remarks: {Remarks}
"
     RESET QStatus
   END

FIND QRecptDate
   WHILETRUE QRecptDate=Yes THEN
        RESET New_RecptDate
        FIND New_RecptDate
        DateA=(New_RecptDate)
        PUT C:\KC10SA\KC10
        CLS
        DISPLAY "
     Now, the recorded information for {PROGMGR}'s {SAType}
{SANumber}
     Title: {SATitle}
     Shows a status of: {Status}
     Received on: {DateA}
     Remarks: {Remarks} "
       RESET QRecptDate
   END
```

```
FIND QRemarks
   WHILETRUE QRemarks=Yes THEN
        RESET New_Remarks
        FIND New_Remarks
        Remarks=(New_Remarks)
        PUT C:\KC10SA\KC10
        CLS
        DISPLAY "
     Now, the recorded information for {PROGMGR}'s {SAType}
{SANumber}
     Title: {SATitle}
     Shows a status of: {Status}
     Received on: {DateA}
     Remarks: {Remarks}

Press any key to continue..."
"       CLS
       CLOSE C:\KC10SA\KC10
       CHAIN C:\KC10SA\SA
       RESET QRemarks
   END

WHILETRUE QRemarks=No THEN
     Reset New_Remarks
     CLOSE C:\KC10SA\KC10
     CHAIN C:\KC10SA\SA
     RESET QRemarks
END
 ;


!!!!! Ask Statements
ASK Check: "  Do you want to Continue or go back to the Main Menu?
";
Choices Check:  Continue, Main_Menu;

ASK SAMgr: "
          Which Program Manager's SA do you want to change?

**NOTE** Type the initials of the Program Manager.... Then, press
ENTER.

EXAMPLES:JF,AML,PR,MH,GH,AM,CB,SH,BF,ADL,TM,LS,TT,KW,RC,RW,JB,CJF
";

ASK SA_Num: "Which SA do you want to change?";

ASK QPROGMGR: "Do you want to change the recorded Program
Manager?";
CHOICES QPROGMGR: No,Yes;
```

```
ASK QSAType: "Do you want to change the recorded SA Type?";
CHOICES QSAType: No,Yes;

ASK QSA_Num: "Do you want to change the recorded SA number?";
CHOICES QSA_Num: No,Yes;

ASK QSATITLE: "Do you want to change the recorded SA Title?";
CHOICES QSATITLE: No,Yes;

ASK QStatus: "Do you want to change the recorded SA status?";
CHOICES QStatus: No,Yes;

ASK QRecptdate: "Do you want to change the recorded SA receipt
date?";
CHOICES QRecptdate: No,Yes;

ASK QREMARKS: "Do you want to change the remarks?";
CHOICES QREMARKS: No,Yes;

ASK New_PROGMGR: "
          Who should be recorded as the Program Manager?

**NOTE** Data is stored by Program Manager's initials.  Please type
the initials the way you want the data stored in the database.

EXAMPLES:JF,ADL,PR,MH,GH,AM,CB,SH,BF,AML,TM,LS,TT,KW,RC,RW,JB,CJF

";

ASK New_SAType: "What should the recorded SA Type be?
";
CHOICES New_SAType: SB,AD,ADM,ASB,AOL,GESB,SL,SBCN;

ASK New_SANumber: "What should the recorded SA Number be?";

ASK New_SATitle: "What should the recorded SA Title be? (You have
30 spaces.)
";

ASK New_Status: "What should the recorded status for {SA_Num} be?

";
Choices    New_Status:    In_Development,    Waiting_SA_Document,
Waiting_Eng_Eval, Awaiting_SARB, Completing_318, MMAR_873_Process,
MMDDTF_873_Process,    MMAP_PR_Process,    PMWBB_Negotiations,
Kit_Order_Process,   Wait_Install_Reqmts,   ACO_Install_Approval,
Wait_DAC_Coversheet,  Coversheet_Approval,  Waiting_Kit_Delivery,
MMAP_875_Process,     MMAR_875_Process,     Wait_Install_Schedule,
Waiting_Kit_Payment,     TCTO_Printing,     Wait_Install_Payment,
Waiting_Field_Receipt, History_File;
```

```
ASK New_Recptdate: "What should the recorded Receipt Date be?

**NOTE** Please enter date as YYYYMMDD.
";


ASK New_Remarks:"What remarks do you want recorded for {SAType}
{SA_Num}?
(You have 30 spaces.)
";
^Z
```

The Service Action Milestones Worksheet
****

THIS PROGRAM IS DESIGNED TO:

1. Provide User with a Date Schedule of SA Steps.
2. Allow User to Change Number of Days Allotted for Each Step.
3. Allow User to Determine the Impact of Changes on SA Process.
4. Provide User an Estimated Final Completion Date.

GENERAL INSTRUCTIONS:
You can move about this program by pressing the <Alt> key and the letter indicated. For example: Press <Alt-M> to proceed or <Alt-Q> to exit this program.

Service Action Process - Main Menu
****

A. Normal Depot Level Service Action Process	<ALT-A>
B. Depot Level No Install Cost Service Action Process	<ALT-B>
C. No Cost Depot Level Service Action Process	<ALT-C>
D. Depot Level No Kit Cost Service Action Process	<ALT-D>
E. Normal Base Level Service Action Process	<ALT-E>
F. No Cost Base Level Service Action Process	<ALT-F>

BE SURE TO USE THE ENTER KEY!

1. Enter Service Action (SA) Number here ---->
2. Enter date of SA receipt here (MM/DD/YY)-->
3. Press the <Alt> key and the letter above which corresponds to the type of SA ------>

Normal Depot Level Service Action Process

Service Action Number: 1234 SA Received on: 07/07/90
Paperwork Completion Date: 04/07/91

Required Actions:	Days to Process	Estimated Compl Date
1. Engineering Evaluation from MMAR complete.	45	08/21/90
2. SA Evaluated at SARB.	15	09/05/90
3. Minutes of SARB and Form 318 complete.	7	09/12/90
4. Minutes sent to DAC.	7	09/19/90
5. Minutes w/Form 318 send to MMAR.	7	09/19/90
6. Funds Mgr notified of SA estimated cost.	3	09/15/90
7. Form 873 completed by MMAR and sent to MMDDTF.	15	10/04/90
8. Form 873 completed by MMDDTF and returned to MMAR.	3	10/07/90
9. Form 873 sent to MMAP from MMAR.	3	10/10/90
10. MMAP completes Purchase Request and request for TCTO cover page & TO update letter to PMWBB.	30	11/03/90
11. PMWBB authorizes Kit purchase.	45	12/18/90
12. DAC orders kit.	20	01/07/91
a. Estimated Kit Delivery from the date the kit was ordered.	75	03/23/91
b. DAC notifies MMAP of Kit Delivery Schedule approx 30 days prior to est kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
c. MMAP send signed 875 Form to MMAR & MMDDTF.	3	02/24/91
13. DAC gives ACO Install Hour Requirment approx 30 days prior to est kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
a. ACO approves Installation Hours.	25	03/18/91
14. DAC gives TCTO to MMDDTF approx 30 days prior to estimated kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
a. MMAR and MMDDTF approve TCTO.	15	03/08/91
b. TCTO distributed to the field.	30	04/07/91

Depot Level No Kit Cost Service Action Process

Service Action Number: 1234 SA Received on: 07/07/90
Paperwork Completion Date: 04/07/91

Required Actions:	Days to Process	Estimated Compl Date
1. Engineering Evaluation from MMAR complete.	45	08/21/90
2. SA Evaluated at SARB.	15	09/05/90
3. Minutes of SARB and Form 318 complete.	7	09/12/90
4. Minutes sent to DAC.	7	09/19/90
5. Minutes w/Form 318 send to MMAR.	7	09/19/90
6. Funds Mgr notified of SA estimated cost.	3	09/15/90
7. Form 873 completed by MMAR and sent to MMDDTF.	15	10/04/90
8. Form 873 completed by MMDDTF and returned to MMAR.	3	10/07/90
9. Form 873 sent to MMAP from MMAR.	3	01/02/00
10. MMAP completes Kit Procurement Request Ltr & request for TCTO cover page & TO update letter to PMWBB.	30	11/03/90
11. PMWBB authorizes Kit procurement.	45	12/18/90
12. DAC orders kit.	20	01/07/91
a. Estimated Kit Delivery from the date the kit was ordered.	75	03/23/91
b. DAC notifies MMAP of Kit Delivery Schedule approx 30 days prior to est kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
c. MMAP send signed 875 Form to MMAR & MMDDTF.	3	02/24/91
13. DAC gives ACO Install Hour Requirment approx 30 days prior to est kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
a. ACO approves Installation Hours.	25	03/18/91
14. DAC gives TCTO to MMDDTF approx 30 days prior to estimated kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
a. MMAR and MMDDTF approve TCTO.	15	03/08/91
b. TCTO distributed to the field.	30	04/07/91

Depot Level No Install Cost Service Action Process

Service Action Number: 1234 SA Received on: 07/07/90
Paperwork Completion Date: 04/07/91

Required Actions:	Days to Process	Estimated Compl Date
1. Engineering Evaluation from MMAR complete.	45	08/21/90
2. SA Evaluated at SARB.	15	09/05/90
3. Minutes of SARB and Form 318 complete.	7	09/12/90
4. Minutes sent to DAC.	7	09/19/90
5. Minutes w/Form 318 send to MMAR.	7	09/19/90
6. Funds Mgr notified of SA estimated cost.	3	09/15/90
7. Form 873 completed by MMAR and sent to MMDDTF.	15	10/04/90
8. Form 873 completed by MMDDTF and returned to MMAR.	3	10/07/90
9. Form 873 sent to MMAP from MMAR.	3	10/10/90
10. MMAP completes Purchase Request and request for TCTO cover page & TO update letter to PMWBB.	30	11/03/90
11. PMWBB authorizes Kit purchase.	45	12/18/90
12. DAC orders kit.	20	01/07/91
a. Estimated Kit Delivery from the date the kit was ordered.	75	03/23/91
b. DAC notifies MMAP of Kit Delivery Schedule approx 30 days prior to est kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
c. MMAP send signed 875 Form to MMAR & MMDDTF.	3	02/24/91
13. DAC gives ACO Install Hour Requirment approx 30 days prior to est kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
a. ACO approves Installation Hours.	25	03/18/91
14. DAC gives TCTO to MMDDTF approx 30 days prior to estimated kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
a. MMAR and MMDDTF approve TCTO.	15	03/08/91
b. TCTO distributed to the field.	30	04/07/91

No Cost Depot Level Service Action Process

Service Action Number: 1234 SA Received on: 07/07/90
Paperwork Completion Date: 04/07/91

Required Actions:	Days to Process	Estimated Compl Date
1. Engineering Evaluation from MMAR complete.	45	08/21/90
2. SA Evaluated at SARB.	15	09/05/90
3. Minutes of SARB and Form 318 complete.	7	09/12/90
4. Minutes sent to DAC.	7	09/19/90
5. Minutes w/Form 318 send to MMAR.	7	09/19/90
6. Form 873 completed by MMAR and sent to MMDDTF.	15	10/04/90
7. Form 873 completed by MMDDTF and returned to MMAR.	3	10/07/90
8. Form 873 sent to MMAP from MMAR.	3	10/10/90
9. MMAP completes Kit Procurement Request Ltr & request for TCTO cover page & TO update letter to PMWBB.	30	11/03/90
10. PMWBB authorizes Kit procurement.	45	12/18/90
11. DAC orders kit.	20	01/07/91
a. Estimated Kit Delivery from the date the kit was ordered.	75	03/23/91
b. DAC notifies MMAP of Kit Delivery Schedule approx 30 days prior to est kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
c. MMAP send signed 875 Form to MMAR & MMDDTF.	3	02/24/91
12. DAC gives ACO Install Hour Requirment approx 30 days prior to est kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
a. ACO approves Installation Hours.	25	03/18/91
13. DAC gives TCTO to MMDDTF approx 30 days prior to estimated kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
a. MMAR and MMDDTF approve TCTO.	15	03/08/91
b. TCTO distributed to the field.	30	04/07/91

Normal Base Level Service Action Process

Service Action Number: 1234 SA Received on: 07/07/90
Paperwork Completion Date: 04/07/91

Required Actions:	Days to Process	Estimated Compl Date
1. Engineering Evaluation from MMAR complete.	45	08/21/90
2. SA Evaluated at SARB.	15	09/05/90
3. Minutes of SARB and Form 318 complete.	7	09/12/90
4. Minutes sent to DAC.	7	09/19/90
5. Minutes w/Form 318 send to MMAR.	7	09/19/90
6. Funds Mgr notified of SA estimated cost.	3	09/15/90
7. Form 873 completed by MMAR and sent to MMDDTF.	15	10/04/90
8. Form 873 completed by MMDDTF and returned to MMAR.	3	10/07/90
9. Form 873 sent to MMAP from MMAR.	3	10/10/90
10. MMAP completes Purchase Request and request for TCTO cover page & TO update letter to PMWBB.	30	11/03/90
11. PMWBB authorizes Kit purchase.	45	12/18/90
12. DAC orders kit.	20	01/07/91
a. Estimated Kit Delivery from the date the kit was ordered.	75	03/23/91
b. DAC notifies MMAP of Kit Delivery Schedule approx 30 days prior to est kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
c. MMAP send signed 875 Form to MMAR & MMDDTF.	3	02/24/91
14. DAC gives TCTO to MMDDTF approx 30 days prior to estimated kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
a. MMAR and MMDDTF approve TCTO.	15	03/08/91
b. TCTO distributed to the field.	30	04/07/91

No Cost Base Level Service Action Process

Service Action Number: 1234 SA Received on: 07/07/90
Paperwork Completion Date: 04/07/91

Required Actions:	Days to Process	Estimated Compl Date
1. Engineering Evaluation from MMAR complete.	45	08/21/90
2. SA Evaluated at SARB.	15	09/05/90
3. Minutes of SARB and Form 318 complete.	7	09/12/90
4. Minutes sent to DAC.	7	09/19/90
5. Minutes w/Form 318 send to MMAR.	7	09/19/90
6. Form 873 completed by MMAR and sent to MMDDTF.	15	10/04/90
7. Form 873 completed by MMDDTF and returned to MMAR.	3	10/07/90
8. Form 873 sent to MMAP from MMAR.	3	10/10/90
9. MMAP completes Kit Procurement Request Ltr & request for TCTO cover page & TO update letter to PMWBB.	30	11/03/90
10. PMWBB authorizes Kit procurement.	45	12/18/90
11. DAC orders kit.	20	01/07/91
a. Estimated Kit Delivery from the date the kit was ordered.	75	03/23/91
b. DAC notifies MMAP of Kit Delivery Schedule approx 30 days prior to est kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
c. MMAP send signed 875 Form to MMAR & MMDDTF.	3	02/24/91
12. DAC gives TCTO to MMDDTF approx 30 days prior to estimated kit delivery date. Note: Enter # of days prior to deliver date--->	30	02/21/91
a. MMAR and MMDDTF approve TCTO.	15	03/08/91
b. TCTO distributed to the field.	30	04/07/91

```
* MENU.PRG - Menu for System
        CLEAR ALL
        SET BELL OFF
        SET COLOR TO W/B,,G
        CLEAR
        SET TALK OFF
        STORE " " TO CHOICE
        @  5, 30  SAY "KC-10 dBASE PROGRAMS"
        @  7, 22  SAY "1 - Delete SA's From SA Database"
        @  9, 22  SAY "2 - List All KC-10 Service Actions"
        @ 11, 22  SAY "3 - EXIT"
        @ 14, 40  SAY "ENTER CHOICE"
        @  3, 16  TO 16, 65    DOUBLE
        @ 14, 53  GET CHOICE
        READ
        DO CASE
          CASE CHOICE = '1'
            DO DEL_SA
          CASE CHOICE = '2'
            DO SALIST
          CASE CHOICE = '3'
            CLEAR ALL
            CLEAR
            RETURN
       ENDCASE
^Z
```

```
* PROGRAM DEL_SA
* This program enables the user to delete unwanted records
*Set environment
SET STATUS OFF
SET TALK OFF
SET SCOREBOARD OFF

*Establishing memory variables
Recno = 0
MCHOICE = " "
MEMTYPE = SPACE(25)

*Opening databases
USE c:\kc10sa\KC10
MORE = .T.

RECALL ALL
*Asking user if they want to delete a record.
DO WHILE MORE
   CLEAR
   MCHOICE = " "
   ?
   ?
   ?
   ?
   ?
   ? "                  1 - DELETE A RECORD"
   ?
   ? "                  2 - EXIT"
   ?
   ?
   WAIT "               ENTER CHOICE  " TO MCHOICE


*Prompting user for records to delete.
      IF MCHOICE = "1"
         CLEAR
         GOTO TOP
         DISPLAY PROGMGR,SATYPE,SANUMBER FOR .NOT. DELETED()
         @19,35 SAY "TYPE RECORD NUMBER YOU WISH TO DELETE"
         @20,35 SAY "OR PRESS RETURN TO EXIT"
         @15,43 GET Recno PICTURE "@9" RANGE 1,RECCOUNT()
         READ
            IF Recno<= RECCOUNT() .AND. Recno>0
               GOTO Recno
               DELETE
               CLEAR
            ENDIF Recno
      ELSE
            MORE = .F.
            LOOP
      ENDIF MCHOICE = 1
```

```
*Varifying user's wish to delete.
   CLEAR
   MORE = .F.
   LIST PROGMGR,SATYPE,SANUMBER FOR DELETED()
   @15,10 SAY "ARE YOU SURE YOU WANT TO DELETE? (Y/N)"
   @15,50 GET MORE PICTURE "Y"
   READ

      IF MORE
        PACK
      ENDIF MORE

   RECALL ALL
ENDDO MORE
CLEAR
CLOSE ALL
RETURN

^Z
```

```
* This program (SALIST.prg) lists SA's In the Database.
SET ECHO OFF
SET TALK OFF
SET STATUS OFF
SET SCOREBOARD OFF
SET BELL OFF
SET CONFIRM ON
USE c:\KC10SA\KC10
MORE = .T.
GO TOP
DO WHILE MORE

DISPLAY PROGMGR,SATYPE,SANUMBER,STATUS FOR MORE
MAYBE=" "
WAIT "     Do you want a printed copy? (Y/N)    " TO MAYBE
@ 10,20 SAY ' '
STORE UPPER(MAYBE) TO MAYBE

     IF MAYBE = "Y"
       SET PRINT ON
       CLEAR
       REPORT FORM SALIST
       CLEAR
       SET PRINT OFF
     ELSE
       CLEAR
     ENDIF MAYBE = "Y"
RECALL ALL
CLOSE ALL
RETURN
^Z
```

Appendix E: Scenarios

1. Program Manager TT received a service action (TEST2) on 02/28/90. It is to be accomplished at Depot Level with no kit or installation costs. Assume all previous steps in the Service Action process have been completed and that the last recorded status was that MMAP received a 873 Form from MMAR.

What is MMAP's next step in the SA process?

_____

On the average, how many days will this step last?
_____ Days

What date do you estimate TEST2 will start to be accomplished on the aircraft? _____

2. Program Manager RW received a service action (TEST4) on 01/03/90. It is to be accomplished at Depot Level and there are kit and installation costs associated with it. MMAR's engineering evaluation took much longer, 95 days, than the usual 45 days. Assume the next steps are completed in the typical length of time and that the last recorded status of the service action was that MMAR sent the 873 Form to MMDDTF.

What is the next step in the SA process?

_____

On the average, how many days should MMDDTF have the 873 Form before they sent it to the next step? _____ Days

Supposing MMDDTF completed their actions in the average length of time and the rest of the Service Action process proceeded at the typical rate, what date do you estimate TEST4 will start to be accomplished on the aircraft? _____

3. Program Manager PR received a service action (TEST5) on 04/18/89. It is to be accomplished at Depot Level with kit costs, but, there are no installation costs associated with it. Assume all previous steps in the Service Action process have been completed and that the last recorded step was that the TCTO cover sheets have been approved.

What is the next step in the Service Action process concerning the TCTO? _____

On the average, how many days will it take to complete this next step? _____ Days

What date do you estimate TEST5 will start to be accomplished on the aircraft? _____

4. Program Manager LS received a service action (TEST7) on 04/23/90. It is to be accomplished at Base Level with kit costs associated with it. Assume all previous steps in the Service Action process has been completed and that the last recored status is that DAC has notified MMAP of Kit Delivery.

What is MMAP's next step in the SA process?

_____

On the average, how many days will this step last?
_____ Days

Due to lack of communication, DAC ordered Kits 100 days after negotiations rather than the typical 20 days. Assuming the rest of the Service Action process proceeds at the typical rate, what date do you estimate TEST7 will start to be accomplished on the aircraft? _____

5. Program Manager GH received a service action (TEST11) on 08/08/89. It is to be accomplished at Base Level with no kit costs associated with it. Assume all previous steps in the Service Action process have been completed and that the last recorded step was that TEST11 was approved at SARB.

What is the next step in the SA process?

_____

On the average, how many days will this step take?

_____ Days

What date do you estimate TEST11 will start to be accomplished on the aircraft? _____

6. Program Manager AM received a service action (TEST12) on 09/05/89. It is to be accomplished at Depot Level with installation costs, but, no kit costs associated with it. Assume all previous steps in the Service Action process have been completed and that the last recorded status of TEST 12 is that MMDDTF assigned the TCTO number and returned the 873 Form to MMAR.

What is the next step in the SA process?

_____

On the average, how many days will this step last?

_____ Days

What date do you estimate TEST12 will start to be accomplished on the aircraft? _____

Appendix F: KC-10/C-9 Program Manager Information

NAME _____

1. Check one category. My age is: (check one)

_____ under 20
_____ 20 - 29
_____ 30 - 39
_____ 40 - 49
_____ 50 - 59
_____ 60 or over

2. I have had the following number of years experience at OC-ALC: (check one)

_____ less than 2 years

_____ 2 - 5 years

_____ 5 - 10 years

_____ 10 - 15 years

_____ 15 - 20 years

_____ more than 20 years

3. I have had the following number of years experience as a KC-10 Program Manager: (check one)

_____ less than 2 years

_____ 2 - 5 years

_____ 5 - 10 years

_____ 10 - 15 years

_____ 15 - 20 years

_____ more than 20 years

4. I have had the following number of years experience working with KC-10 service actions &/or KC-10 TCTOs: (check one)

_____ less than 2 years

_____ 2 - 5 years

_____ 5 - 10 years

_____ 10 - 15 years

_____ 15 - 20 years

_____ more than 20 years

5. I would rate my knowledge of the KC-10 Service Action Process as: (check one)

_____ No knowledge at all

_____ Limited knowledge

_____ Mediocre

_____ Knowledgeable

_____ Very Knowledgeable

6. I am working the SA scenarios: (check one)

_____ manually

_____ with the computer system

7. I would rate my experience in interacting with a computer as: (check one)

_____ No experience at all

_____ Limited experience

_____ Mediocre

_____ Experienced

_____ Very Experienced

8. I would rate my experience in interacting with MSDos as: (check one)

_____ No experience at all

_____ Limited experience

_____ Mediocre

_____ Experienced

_____ Very Experienced

9. I would rate my experience in interacting with dBaseIII+ software: (check one)

_____ No experience at all

_____ Limited experience

_____ Mediocre

_____ Experienced

_____ Very Experienced

10. I would rate my experience in interacting with VPExpert software: (check one)

_____ No experience at all

_____ Limited experience

_____ Mediocre

_____ Experienced

_____ Very Experienced

11. I would rate my experience in interacting with the ENABLE software: (check one)

_____ No experience at all

_____ Limited experience

_____ Mediocre

_____ Experienced

_____ Very Experienced

12. I would rate my experience in interacting with the ENABLE Spreadsheet software: (check one)

_____ No experience at all

_____ Limited experience

_____ Mediocre

_____ Experienced

_____ Very Experienced

13. I would rate my experience in interacting with QUATTRO Spreadsheet software: (check one)

_____ No experience at all

_____ Limited experience

_____ Mediocre

_____ Experienced

_____ Very Experienced

Appendix G: KC-10 ES-DSS-DB System Critique

Please use the space provided to make comments about the KC-10 ES-DSS-DB System.

1. What part of the system did you like?

2. What part of the system did you NOT like?

3. What part of the system do you think might be the most useful to KC-10 Program Managers?

4. If you found part of the system difficult to understand or work with, please indicate that part of the system. How might the system be changed to make it more understandable or easier to work with?

5. What other additions or improvements do you think might be useful to KC-10 Program Managers?

6. Please use the space below to make any other comments about the KC-10 ES-DSS-DB system.

7. Please use the space below to make any comments on the User Guide. What improvements might you suggest?

Appendix H: KC-10 ES-DSS-DB System Critique Comments

1. What part of the system did you like?

All of it! I'm impressed with automated capability to manage and maintain status on Service Bulletin incorporation. The system is very user friendly.

Easy movement from part to part.

I liked all of it. Especially the ease of operation and the logic behind it.

User friendly.

The system is very well designed - like it all.

Very user friendly - Easy to follow. Reminder of necessary steps required for service action processing.

The overall process is very easy to work with. Good job.

Quattro.

2. What part of the system did you NOT like?

The name of the system. The name should be more unique rather than descriptive of the software programs used. Suggest the system be named: KC-10 ASAS (automated service action system) or KC-10 ASAP (automated service action program), etc.

Not being able to save changed milestone dates.

No comment.

None.

Inability to save individual recorded SA completion dates.

3. What part of the system do you think might be the most useful to KC-10 Program Managers?

Standardization of service action incorporation and training tool for new or inexperienced Program Managers.

Estimated Completion Dates. Although, all of the SA advisor parts guiding the Program Manager through the steps will be very useful.

Knowing where every SA is at any given time.

Add or change milestone dates.

The list of SAs milestone dates.

Milestone layout - very critical with today's money crunch.

The entire program is useful in the management of service actions - can't visualize deleting any portions.

Ease of access and updating.

4. If you found part of the system difficult to understand or work with, please indicate that part of the system. How might the system be changed to make it more understandable or easier to work with?

I didn't find the system difficult to understand.

System works well and easy to understand.

System was easy to use.

Maybe some word changes to some of the options would help the user.

System simple to understand and use.

5. What other additions or improvements do you think might be useful to KC-10 Program Managers?

Don't know at this point.

No comment.

Quick Reference on Completed Actions (Closed). Quick Reference on Service Actions Not Closed. Could be used as a "suspense"?

Fully automated.

None at this time.

System could be expanded to provide output forms, letters, and notifications to all organizations in the SA process. e.g. SARB work sheet, AFLC Form 318, 873 Form, Form letter to contractor, etc.

6. Please use the space below to make any other comments about the KC-10 ES-DSS-DB system.

Once system is expanded and perfected, Local Area Network (LAN) linkage may preclude the need for output forms/letters to the various organizations involved. Tasking could be suspense in the system for next step or stage of SA incorporation.

Good system, easy to use.

Keeping track of the numerous SAs has been a problem for a long time. The system will undoubtedly keep all the managers aware of what's going on in the KC-10 community, not only with my systems but with all systems.

Worthwhile system.

For the engine portion of the service action process, Depot incorporation with no cost will not have a TCTO number issued.

This system is long overdue - Will certainly provide Program Managers an invaluable tool to manage Service Actions. All to often one is lost in the process and this program will help ensure accurate tracking.

Good.

7. Please use the space below to make any comments on the User Guide. What improvements might you suggest?

Very well written - easy to understand. A great refresher when time elapses between updates. Good job.

It all looks good to me.

Well written.

Good basic directions. In logging on the system - repeat directions from main menu (i.e. C:, CD\KC1OSA etc. for Program Managers not computer literate.)

Suggestion: Users guide could be modified to reflect the standard step/stages of SA incorporation.
Comment: My compliments to the developer. This design effort as a thesis project is a noble gesture indeed to enhance the Program Manager's effectiveness.

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13. ABSTRACT (Maximum 200 words)

The primary objective of this research was to develop an integrated computer system and determine whether or not the system could help KC-10 logisticians better manage contractor recommended modifications to the KC-10 aircraft. An integrated prototype evolved from the development of different parts of the system and the integration of those parts into one system. Testing of the system involved having twelve KC-10 Program Managers solve six scenarios. Six people used the system to answer scenario questions and six people answered scenario questions without the system. Comparisons of the results of the scenario tests confirmed that using the prototype significantly improved the test performance of the Program Manager. The conclusions of this research include recommendations to implement this prototype in the KC-10 System Program Management Office and to adapt the prototype to other contractor logistics supported weapon systems to help other logisticians raise their management performance levels.

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